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Is Denmark a green entrepreneurial state?

Mapping Danish climate politics between civic mobilization and business cooptation

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Abstract

This article is based on digital methods research using the tools Hyphe, Gephi and CorText to map the relations between public Danish actors – from informal civil society groups and NGO's to business and state actors – and their “matters of concern” (cf. Latour 2004) in the heated political situation around the development of green transition policies following the enactment of the Climate Act in 2019. The Act was, according to the newly elected social democratic government, the “most ambitious Climate Act in the world”. It included such political innovations as the Citizens’ Assembly on Climate Change, a group of 99 randomly selected citizens mandated to give recommendations to parliament, and a series of Climate Partnerships, business and industry collaborations tasked with developing recommendations and frameworks for the business community’s engagement in the green transition. The Climate Act was passed after massive popular pressure from the civic climate movement leading up to the election. Despite these efforts and the apparent political will to engage with multiple voices and interests, our network mapping shows that the business community, with an emphasis on “innovative and technological solutions”, were soon to become dominant in the network and align themselves more closely with the political system than the civil

society actors were able to with their repeated calls for more radical and political action on climate change.

Keywords

Climate Change, Green Transition, Digital Methods, Controversy Mapping

Introduction

In the spring of 2019, prior to the Danish Parliamentary election, around 30.000 school children and their parents, students, grandparents, scientists, and activists rallied in front of the national parliament in the “People’s Climate March”, demanding that politicians legislate for a more ambitious climate policy and live up to the requirements of the Paris Agreement. The media portrayed the event as the culmination of the Danish ‘climate movement’, which succeeded in turning climate change into *the* paramount issue in the election. In her inaugural speech, PM Mette Frederiksen congratulated civil society on making the election “the first climate election in Danish history”, and in December 2019, after months of negotiations, Minister for the Climate Dan Jørgensen announced the signing of “the world’s most ambitious Climate Act”, committing Denmark to a 70 percent reduction in CO2 emissions by 2030.

The Climate Act contained plans for including both civil society and corporate partnerships in Denmark’s green transition. Civil society was to be engaged through the “Citizens’ Climate Assembly”, composed of 99 randomly selected citizens that, through a series of deliberative seminars with experts, would deliver recommendations for how Denmark should reach its 2030 climate target. In a similar manner, corporate Denmark was included in an advisory role through 14 “Climate Partnerships” representing industry conglomerates (e.g. agriculture, construction, energy and supply). While both initiatives were introduced in autumn 2019, the Climate Partnerships delivered

their recommendations in March 2020 (Dansk Industri 2020a), whereas the Citizens' Assembly was delayed and did not announce its recommendations until April 2021 (KEFM 2021). During this period, a divide formed between the groupings: the civil climate movement, supported by scientific experts, expressed concern and dissatisfaction with the government's lack of progress on the green agenda (Klimarådet 2021), while the government - supported by its Climate Partnerships which consistently provided pushback against changing the status quo (Gjerding 2020, Dansk Industri 2020b, Dansk Industri 2022a) - claimed to uphold a world-leading role in the green transition (Hannestad 2021). Hence, despite the massive mobilization of the public, the momentum fizzled out in the years following the election, as the public's calls to take climate change seriously were sidelined by a coalition of corporate actors and politicians apparently less interested in societal transformation.

In 'A Green and Sustainable World – The Danish Government's Long-Term Strategy for Global Climate Action', the most elaborate declaration on the Danish Climate Act, the government refers to Denmark as "a green entrepreneurial nation" (Regeringen 2020: 8). If we turn to its parallel in the social science literature, Mariana Mazzucato has defined the green entrepreneurial state as a state-led investment model focused on centering the state economy around efforts of decarbonization (Mazzucato 2015). Such efforts require overturning current ways of producing and consuming, e.g. by following expert advice and imposing CO2-taxation (Klimarådet 2021), and by establishing new tools and principles for policy-making (Mazzucato et al. 2020).

In the Danish case, such progressive demands on the state are, however, contrasted by the balancing of economic and environmental efforts in four 'guiding principles' for the Climate Act stating that 1) Denmark must be a globally leading figure in climate change mitigation, 2) goals must be reached as cost-efficiently as possible by "developing and not dismantling Danish businesses", 3) green transition and welfare state policies should be mutually balanced, and 4) Danish CO2-reductions must not be "leaked" to other countries (Climate Act

2020 §1). With such evidently contrasting aims, it is no wonder that the political situation around climate change¹ in Denmark has become controversial. Indeed, recent scholarship drawing inspiration from the concept of 'weak ecological modernization' (Hajer 1997) has criticized the Danish government's efforts for favoring competitive, market-led, and growth-oriented invention and development of new technologies, such as Carbon Capture and Storage and Power-to-X over policy innovations (Willig & Blok 2021, Voldsgaard et al. 2022).

It is against this contested backdrop that we – drawing on actor-network theory (ANT) and digital controversy mapping (see Venturini 2010, Marres 2012, Munk 2019) - have visualized and explored the political situation (Barry 2012) with the aid of digital tools *Hyphe*, *CorText* and *Gephi*. We use Barry's term political situation to emphasize the indeterminacy of the climate political field in this period; how it is made up of a moving field of "controversies, conflicts and events, including those that have occurred in the past and that might occur in the future" (2012: 330). Methodologically, our study can be construed as a 'controversy mapping', following Venturini and Munk's definition of the term as the unfolding of "sociotechnical disputes in a conceptual space where its multiple actors and issues can be weighed against each other" (2022: 5). By using digital methods to map the relational dynamics between the actors, as well as the different semantic understandings of the climate crisis and its solutions articulated among them, we gain new insights into the following matters of the political situation around climate change politics and green transition in Denmark: *What characterizes the public conglomeration of actors that emerged in the wake of the Climate Act? How do actors concerned with green politics convene, with whom, and around which issues? What are their concerns and suggestions for Denmark's green transition, and which fault lines emerge?*

1 In line with the political language, we will use the terms 'climate change', 'green politics', and 'green transition' interchangeably. While climate change may be too narrow to encompass the many issues, suggested solutions and conflicts that emerge in our data it is also too central a signifier to leave out.

In the next section, controversy mapping in STS and online will be introduced, after which the analysis will introduce two types of mappings made with different digital tools: the webcrawler *Hyphe* and the semantic analysis tool *CorText*. We conclude by returning to a discussion of Denmark as a 'green entrepreneurial state'. We argue that despite the government's apparent attempts to seek new avenues for innovative, publicly inclusive forms of policymaking on the climate agenda, in practice, the government almost exclusively accommodates the concerns of business actors² and not those of civil society.

Digital methods and controversy mapping – in STS and online

STS and digital methods scholar Tomaso Venturini describe controversies as a dynamic space where "social unities that seemed indissoluble suddenly break into a plurality of conflicting pieces" (2010: 261) and where, inspired by Latour's sociology of associations (2005), "any actor can decompose in a loose network and any network, no matter how heterogeneous, can coagulate to function as an actor" (Venturini 2010: 262). Controversies cannot be reduced to controversial statements uttered by single actors but must be traced through the web of relations they generate and enter into and out of (Callon 1989: 93). In this atmosphere of contestation, when it comes to climate change and green transition, even the meaning of the word 'green' is up for debate together with fundamental questions, such as: what kind of change does a 'green transition' require: degrowth, science-led technological innovation, new business models, further state regulation? What counts as 'nature', and which role should nature play in the green transition? And what do we understand by terms like 'sustainability' and 'CO2-neutrality', and who gets to define their meanings?

Controversy studies has a rich tradition within STS, focusing on

² We will use the English word 'business' to refer to business, industry and corporate actors. In Danish, the word would be 'erhvervsliv'.

the status of and relations between science and expertise in contemporary society - especially in relation to lay people's knowledge and concerns (Horst & Irwin 2010, Wynne 1992, Epstein 1996, Whatmore 2009, Barry 2013) - and to how disputes arise and are handled in scientific knowledge production (Latour & Woolgar 1986, Pickering 1984, Collins 1981, Pinch 1981). While controversy studies predate digital tools and methods, the recent invention of open source software to capture and transform digital traits into datasets and networks that can be visualized and analyzed has created a major surge in the field of digital controversy mapping in the past two decades (Rogers 2013, Marres 2017, Munk & Venturini 2022).

We used the web crawler *Hyphe* to harvest hyperlinks between websites and assemble a network of what Richard Rogers calls a "hyperlink-diplomacy" (2002), referring to how hyperlinks reveal mutual "associational aspirations" (Rogers 2012: 201) to each other. These connections can be *cordial*, between actors that link to one another and thereby form some sort of alliance; *aspirational*, if, for instance, a minor company links to a larger global foundation; or *critical*, as actors may link to opponents to express disagreement (Rogers 2012: 200).

The aim of assembling and visualizing a corpus of self-declared climate actors on the web is to produce maps of the Danish political situation around climate change and green transition characterized by "second-degree objectivity" (Venturini 2010). Since controversies are a very dynamic type of conflict (2010: 262), a representation of a political situation containing multiple controversies should not aspire to present or prioritize between different "matters of fact", but rather make visible the many subjective and engaged viewpoints or "matters of concern" (Latour 2004a) that make up the situation (Venturini 2012: 798).

By representing the case through hyperlink connections, we are aware that the entities observed are defined by the traces at our disposal (Moretti 2013, Venturini et al. 2018). This means that the mapped actors are defined by and only become visible through their hyperlinks, and this involves a risk of marginalizing actors that do not

organize through websites (Marres 2015: 666). That is indeed the case for one key actor in the climate movement, Extinction Rebellion, which organizes over encrypted network services, has limited official online presence and, hence, does not appear centrally in our maps.

A further important note is that while digital methods enable the capture and organization of large amounts of data, we cannot claim that the resulting visualizations offer exact representations of the situation (Venturini 2010, 2012, Marres 2015, Marres & Rogers 2005, Jacomy 2020, Latour 2004b). The network is not the controversy but a way to know it (Jacomy 2020: 2); hence, a map is not so much a representation and result in itself, as it is a tool for exploration and analysis (Venturini et al. 2021). In the following, we will detail how our use of the webcrawler *Hyphe*, and the iterative curational loops of selecting which actors to include in our network (Ooghe-Tabanou et al 2018: 14), has informed our analysis of the relations between civil society, business networks and state politics of green transition in Denmark.

Curating the Danish political situation around climate change and green transition

With the “People’s Climate March” the culmination of 2019’s civic climate movement, we decided to initiate our crawl by importing into *Hyphe* the web addresses of the 33 actors (mainly NGOs) that took part in organizing it (see figure 1). The event also marked a heated controversy between a heterogenous assembly of dissatisfied citizens on the one side and politicians on the other. Hence, our initial research interest was in the public mobilization around climate change as a politically salient issue in Denmark. What we found, however, surprised us, as the next section will detail.



PARTNERE

350 Klimabevægelsen DK / NOAH / Mellemløst Samvirke (ActionAid Danmark) / Greenpeace Danmark / Omstilling Nu / Rådet for Bæredygtig Trafik / Verdens Skove / Bedsteforældrenes Klimaaktion / TIDLIFRED-aktivmodkrig / Black Lives Matter Danmark / CARE Danmark / Sex & Samfund / Det Økologiske Råd / Klimakollektivet / Skifergas NEJ TAK / Fredsvagten ved Christiansborg / Vedvarende Energi / UngEnergi / Oxfam IBIS / Danmarks Naturfredningsforening / WWF / Cyklistforbundet / Materiale Centralen / Global Aktion (tidl. Afrika Kontakt) / CONCITO / Red Orangutangen / Den Grønne Studenterbevægelse / Folkekirkens Nødhjælps Ungdom / Amnesty International Danmark / Klimastrejke - Fridays For Future Denmark / Nyt Europa / Øko-net / BirdLife/Dansk Ornitologisk Forening / Plastic Change /



Figure 1a. The above image shows the partners behind the “People’s Climate March” (www.folketsklimamarch.dk). The links are imported into *Hyphe*, which crawls them for hyperlinks (Figure 1b). The crawl results in a prospect list (Figure 1c) from which the researcher manually chooses which proposed web entities to include in the corpus. Websites can be visited and explored for their relevance by clicking on the entity names.

but rather to assemble actors that claim sustainability as a “matter of concern”.

3) Media sites and newspapers are excluded since they rarely make clear statements on their stance on the keywords as an actor (even if journalists or editors might do so as individuals). Social media accounts (Twitter, Facebook, and Instagram) are also excluded, since *Hyphe* cannot legally access them to crawl their API’s.

4) The actor must receive more than two in-links from the crawled population - unless we know the actor to be central to the controversy, in which case it can be added manually.

After iteratively sifting through the prospected websites and visiting them to assess which ones to include, we sensed that the assembly of actors drifted from the initial all-NGO starting points to include an array of companies, business networks and corporate interest organizations. When importing our final corpus of 456 actors to the network visualization tool *Gephi* to produce a visual representation of how the actors “aggregate” by means of hyperlinks (Ooghe-Tabanou et al. 2018: 16), we then had a particular interest in the different “types” of actors engaged in the controversy. Based on our insights in the actors from visiting the websites of the corpus, we tagged seven different actor categories, resulting in the network map in figure 2.

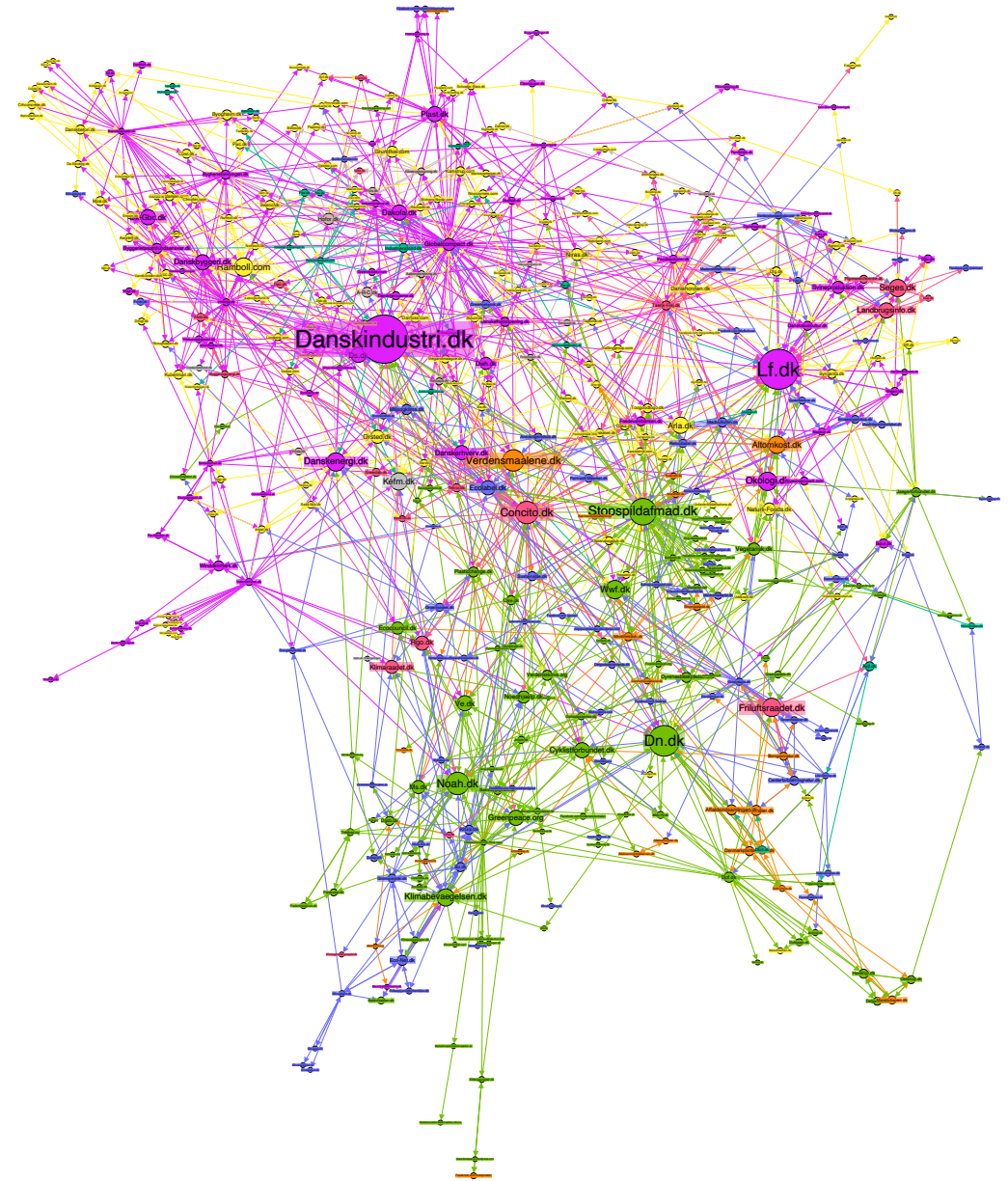


Figure 2: Hyperlink network of businesses, business networks, campaigns, and NGOs engaged in the climate agenda. Visualized in Gephi, spatialized by the ForceAtlas2 algorithm (Jacomy et al. 2014) (scaling 15000, Gravity 1), attracting well interlinked nodes and repulsing those loosely connected. Node size represents the number of in-links received from the network, colors represent our categorization of the actor (see below). Edge colors show the direction of the link (e.g. green edges are links from a green actor).

Yellow actors are companies (33,85% of all actors), **Green** actors are NGO's (19,12%), **Blue** actors are forums and blogs (17,14%) (from fairtrade certificates to individual people's blogs), **Purple** actors are business networks (14,07%) (such as the Confederation of Danish Industry), **Orange** actors are campaigns (4,8%) (from the Danish UN Sustainable Development Goals to trans-local tree planting efforts), **Red** actors (4,2%) are think tanks or research entities (from Klimarådet, the independent council of climate experts monitoring the government's climate efforts, to SEGES, the research department of the agricultural industry), **Cyan** actors (3,74%) are funds (mainly pension funds), **Light brown** actors (2,42%) are public-private companies (like Hofor, the supply company of Copenhagen Municipality), and the **Grey** actor in the center is the Ministry for Climate and Energy (KEFM), included in the corpus to obtain the Citizen's Assembly on Climate Issues as a node in the network³, barely visible below Klimarådet, though not receiving a link from it.

What is surprising about figure 2 is that despite our starting points of 33 civil society actors, nearly 50 percent of the resulting network is comprised of business networks and companies. NGO's and campaigns account for only 25 percent of the network. In the digital methods literature, topic or issue drift is considered a methodological

³ Although including the Citizen's Assembly forced us to go beyond our curatorial principles (and include the state actor KEFM), it has been included because the Assembly is the formal expression of the public's inclusion in climate change politics after the election.

challenge (Chakrabarti 2002), and *Hyphe* is designed in response to this, as it gives the user curatorial control with the issue and hence the ability to keep it in check, cf. our selection principles above (Jacomy et al. 2016: 597). What we observe, by contrast, is a different problem, namely that of *actor drift*. Instead of a map primarily composed of civil society organizations involved in green transition, we arrive at a business-dominated map with civil society actors more marginally represented. Moreover, the business actors are not present in the map due to their adversarial relations to the other network actors (after all, industrial emissions are the root cause of the climate crisis), but rather due to their recognition of climate change as a societal problem and their supposed engagement with the green transition.

Business actors have become climate actors for at least for two reasons: 1) Since 2008 all major companies have been legally obliged to report on their environmental and climate-related CSR-efforts, which has led to a lot of *mentioning* of sustainability initiatives on their websites (Erhvervsministeriet 2019: §99a). 2) The government's aforementioned 'Climate Partnerships' systematically involved the business sector in the development of new climate initiatives in 2019-20. With these political means, businesses have increasingly become climate actors; but perhaps a different *kind* of actors from civil society actors. If business and civil society actors were engaged in solving the same problem, one might expect mutual linking and citing, suggesting cooperation between them. There is, however, a strict divide between the two groups, with barely any NGOs present in the corporate part of the network and hardly any companies present among civil society actors. Since opposing groups rarely cite or hyperlink to each other, this dynamic is not uncommon and resembles other 'actor type'-based controversy visualizations, for instance Adamic and Glance's highly segregated map of Democratic and Republican blogs in the US (2005) and Munk's visualization of wind turbine advocates and skeptics (Munk 2014). What sets our mapping apart is that while these studies are based on controversies with clearly demarcated opposing groups and positions on the contested issue, our assembly is based on a supposedly

shared interest in furthering the same cause. If the actors involved in climate change are not engaging with each other, what does that say about the current state of the situation in Denmark?

What is the political situation about?

Figure 2 does not tell us about the matters of concern at stake. To achieve this insight, we used a community detection algorithm (Blondel et al. 2008) in *Gephi* to reveal structures of highly interlinked nodes.

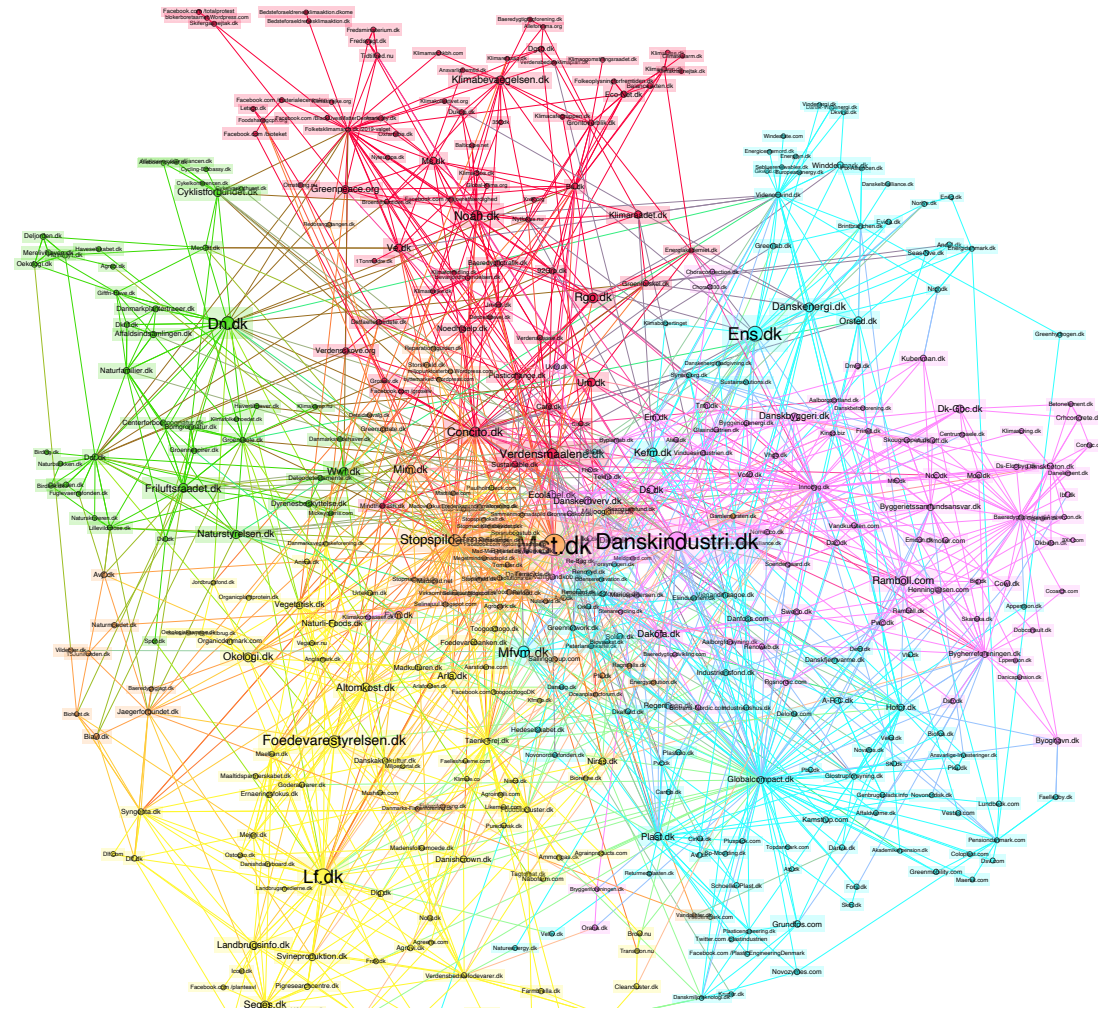


Figure 3: A network based on a corpus similar to figure 2, but with the addition of relevant state ministries and agencies. Their links alter the gravity of the network, hence its different composure from figure 2, although spatialized with the same setting in the ForceAtlas2 algorithm (Jacomy et al. 2014) (scaling 15000, Gravity 1). The node size is defined by the amount of in-links, and the colored clusters are computed with a “modularity class” algorithm (Blondel et al 2008) set to 1 (default).

Instead of classifying actors according to our categorization of what they *are*, we visualize what they *do* through their hyperlink-diplomacy on the web (figure 3). Identifying communities through relational actions rather than inherent identities corresponds with Latour’s use of the word “worknet” rather than “network”. “It’s the work, and the movement and the flow and the changes that should be stressed” (Latour 2004b: 63). We were curious to see what formations, alliances and antagonisms the hyperlink politics of the network actors would reveal.

While we have been committed to following the work of the Climate Act from below by assembling it step by step, we eventually decided to include state institutions in the map. We included the ministries involved in the “Green Business Forum” (Erhvervsministeriet 2023), convened by the Ministry of Industry, Business and Financial Affairs’ (em.dk): Climate, Energy and Utilities (kefm.dk), Foreign Affairs (um.dk), Taxation (skm.dk), Food Agriculture and Fisheries (mfvm.dk), Environment (mim.dk), Education (uvm.dk). The Ministries of Health and Housing are also a part of the Forum but did not receive links from the non-state actors and are not included. We also included four state agencies: Energy (ens.dk), Environment (mst.dk), Nature (naturstyrelsen.dk) and Foods (foedevarestyrelsen.dk). Since our focus was on investigating the approaches to national climate politics among non-state actors, we decided not to crawl the hyperlinks of the ministries and agencies, but instead let their position remain a result of how the civil society and business actors position them in their network formations.

The **Blue Cluster** (*energy and supply*) is the largest in the network (23,1 % of all actors) and contains actors from the energy sector (e.g. Ørsted and the industrial confederation Dansk Energi) in its northern part and a mix of actors from the supply sector (e.g. the public-private supply agency of Copenhagen, Hofor), major pension funds and Verdensmålene, the Danish UN SDG-initiative. The cluster is cut in half by the **Purple Cluster** (*construction and renovation*, 17%) centered around the Confederation of Danish Industry (Danskindustri.dk), the non-state actor with the most in-links, 51, in the network. Other central actors are the consultancy company Rambøll, the Danish Construction Confederation (“Dansk Byggeri”), and the Danish Waste and Resource Network (“Dakofa”). The **Yellow Cluster** (*agriculture and food*, 19,2%) also has one main node: The Danish Agriculture and Food Council (Lf.dk, 36 in-links, second largest in the network). Other notable actors are businesses like Arla and Danish Crown, knowledge institutions like SEGES, and associations like Organic Denmark (Okologi.dk). The latter borders the **Green Cluster** (*nature NGOs*, 12,7%), which has the Danish Nature Conservation Society (DN, 26 in-links, largest NGO in network) as its main node. The cluster consists of diverse civil society initiatives, like the World Wildlife Foundation (WWF), the Danish Outdoors Council (Friluftsrådet.dk), the Danish Biking Association (Cyklistforbundet.dk) and the Danish Ornithological Association (Dof.dk). The **Red Cluster** (*Climate NGO’s and think tanks*, 19,5%) consists solely of NGO’s and contains most of the actors arranging “The People’s Climate March” in 2019, including Klimabevægelsen (The Climate Movement), the main organizer of the event, located in the eastern part of the cluster, close to new initiatives like The Green Youth Movement (*née* The Green Student Movement) and Extinction Rebellion. These have a fairly low number of in-links (5 and 1), hinting either that they receive low attention from other actors on the web, or that they do not have a developed website and that this is not how they organize and campaign. This points to a “digital bias” (Marres 2015) in the hyperlink-based method, since our mapping does not adequately capture organizations and initiatives that we know have received massive media coverage and

been highly influential in shaping the green agenda. The **Orange Cluster** (*recycling*, 8,4%) in the center of the network is centered around the NGO Stop Food Waste (Stopspildafmad, 15 in-links), and sprawls into other clusters: oceanplasticforum.dk in the blue cluster; brick recycling (gamlemursten.dk) in the purple, repair initiatives (reperationsguiden.dk) and home decor donation platforms (storskrald.dk) in the red. Regarding the state actors (encircled), the agencies receive the highest number of links (the Environmental Protection Agency is the largest node in the network with 54 in-links), while the ministries appear in a minor role with the Ministry of Environment the largest with 21 in-links. It is notable that most state actors appear in the “business communities” of the network, meaning that they receive more links from here than from NGO’s. They are, however, not deeply imbedded in these networks. In fact, the state actors almost form a ridge separating civil society (left) from the cooperate network (right).

Despite the relatively high ‘scaling’ (repulsion between nodes in the Force Atlas spatialization algorithm) of the network (n=15000), it is not entirely visually clear where the dividing issues between the communities are located. There seem to be many issues at play simultaneously, and the same actor can relate to several of these. For instance, the second-largest node in the network, which is, perhaps surprisingly, Dansk Industri, receives links from all the clusters. Although not a “hairball network”, the community detection algorithm has been a useful tool to detect a clustering of sub-controversies based on link densities that are not visible to the eye (Jacomy 2021: 128), as will be unfolded below.

Climate diplomacy or cooptation?

A question that arises from the network visualization is how and to what extent the adversely associated network actors relate to one another. A central player in the red cluster (climate NGO’s and think tanks) is CONCITO, “Denmark’s green think tank”, which works for “building a climate-safe future” (concito.dk).

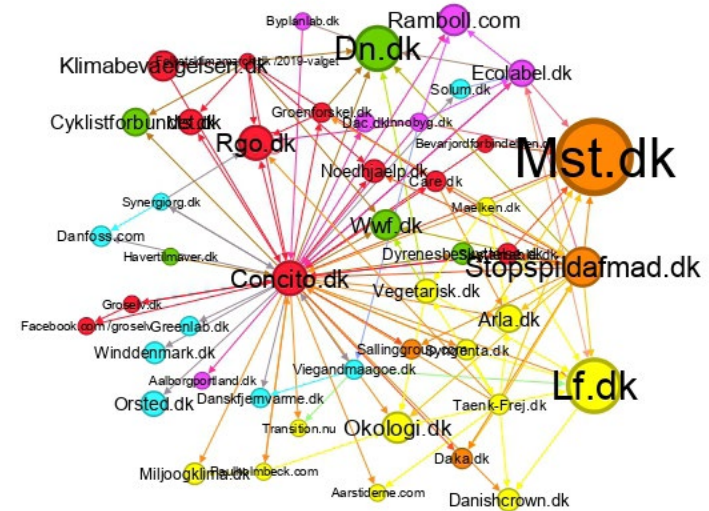


Figure 4 “Ego-network” of CONCITO showing all out- and in-linked websites (arrow on edges indicate direction of link) and their mutual connections. Spatialized with ForceAtlas2 (Jacomy et al. 2014) (Scaling: 10.000).

CONCITO receives and gives links to all other clusters in the network (see figure 4) and is thereby central in connecting the red cluster to the network, including the industrial actors. Looking more closely at CONCITO’s relation to the meat processing company Danish Crown (DC), for example, the link to DC is *both critical and cordial* (cf. Rogers 2012). CONCITO has published a response to DC’s critique of their database of the carbon footprints of food types (which was critical of the large CO2 footprint of meat) (CONCITO 2021), but CEO Christian Ibsen and chairperson, the former conservative climate minister Connie Hedegaard, also express their enthusiasm of Danish Crown becoming a formal collaborator of CONCITO (CONCITO 2019).

Interestingly, the nuanced hyperlink-diplomacy (Rogers 2002) that CONCITO practices is not returned by Danish Crown (nor by other major industrial actors in CONCITO's network, e.g. Aalborg Portland (Denmark's single largest CO2 emitter), Arla, Rambøll, or Ørsted). This tendency for industrial actors to “cut off” civil society is also evident when studying Dansk Industri (DI)'s ego-network (see figure 5).

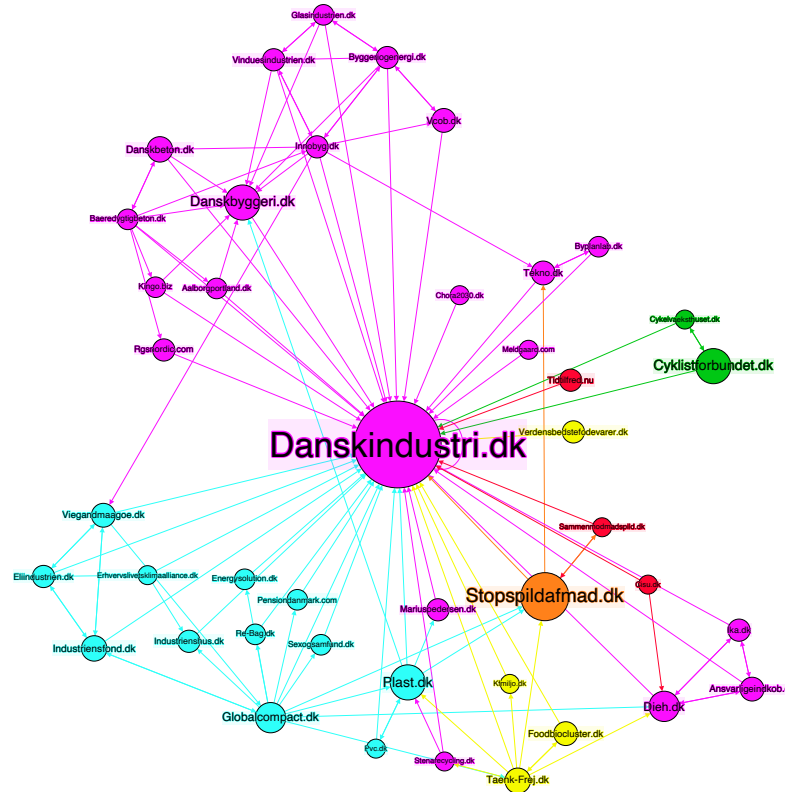


Figure 5 “Ego network” of Dansk Industri showing all its in- and out-linked websites and their mutual connections. Spatialized with ForceAtlas2 (Jacomy et al 2014) (scaling: 10.000)

Semantic rifts in the controversy

Whereas the hyperlink network provides an overview of *who* the actors link to, a text-based semantic mapping can offer insight into *how* they describe their own engagement in the green transition. We have used the open-source software *CorText* to parse and map a dataset of text from a selection of 51 of the most cited actors in the network. In sampling representations from different actors engaged in an issue, Venturini points to the importance of “scaling” the arguments of different actors in accordance with their participation in the issue. Just as it would be misleading to give equal weight to the viewpoints of the scientific community of IPCC and to the much smaller group of climate skeptics (Venturini 2012: 798), it would be misleading for us to include an equal number of actors from the green “Nature NGO”-cluster as from the larger, blue “Energy and supply”-cluster. Thus, the percentual number of actors in each cluster (Table 1) has guided our selection of the 51 actors in the semantic network.

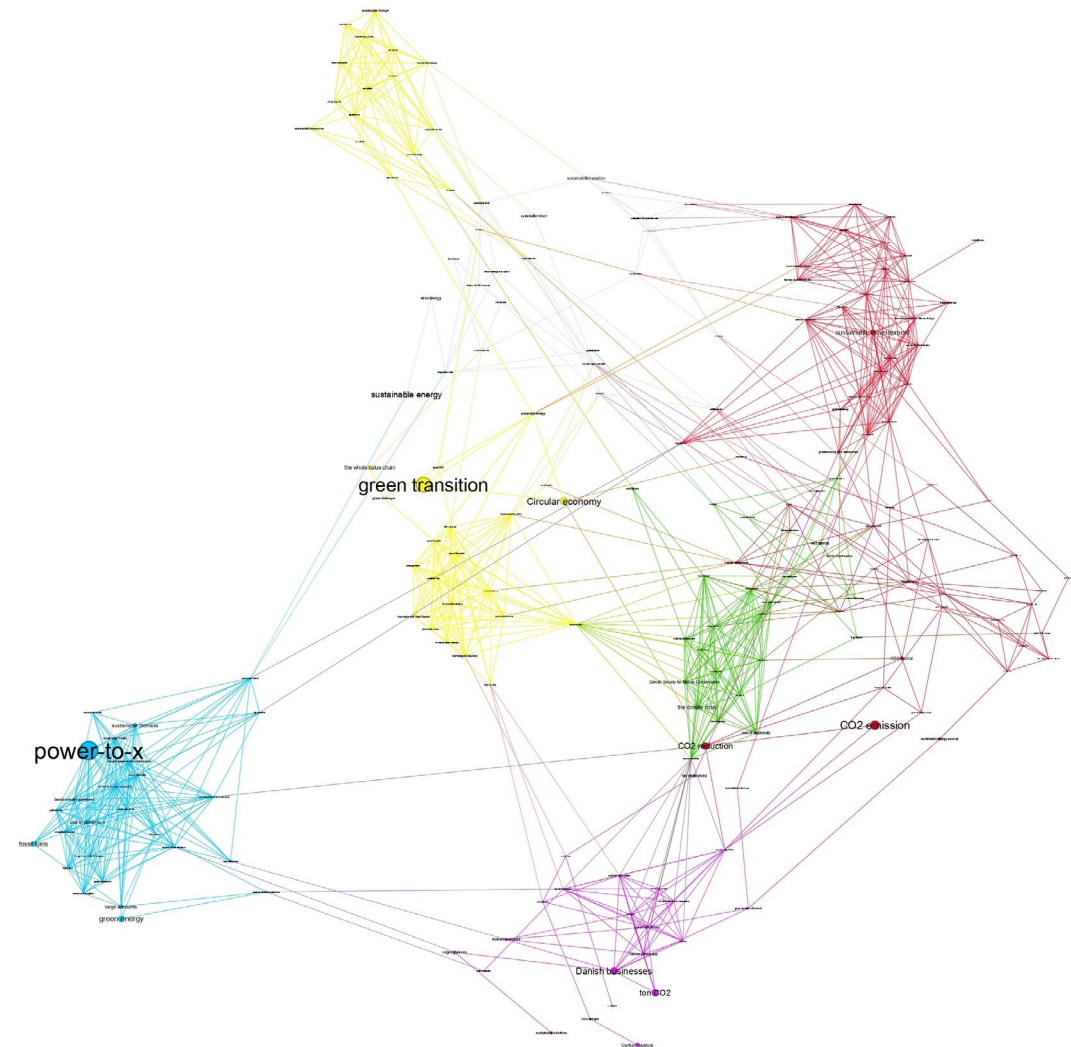
Blue cluster (energy and supply)	23 % / 11 most cited actors
Red cluster (climate NGOs)	20 % / 10 most cited actors
Yellow cluster (agriculture)	19 % / 10 most cited actors
Purple cluster (construction)	17 % / 9 most cited actors
Green cluster (nature NGO's)	13 % / 6 most cited actors
Orange cluster (recycling)	8 % / 4 most cited actors

Table 1

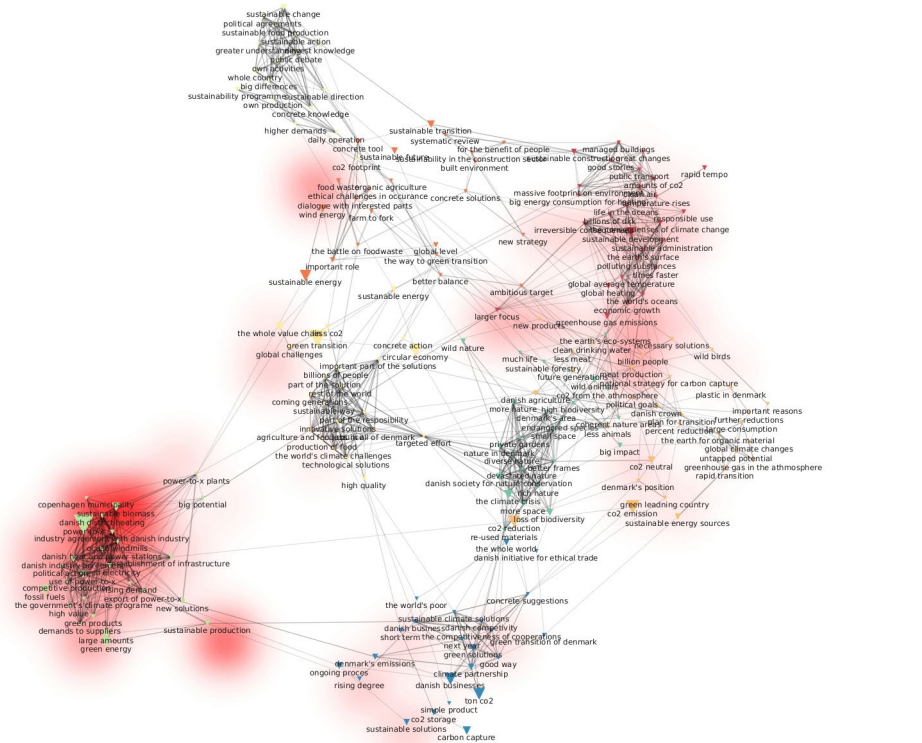
Deciding on what text material to select from each actor's website required a qualitative “webnographic” inquiry (Isfeldt et al. 2022) into the websites. Writing a script to scrape all website text from the named actors would not generate a proportional or precise enough comparison, as some actors, e.g. Klimabevægelsen, dedicate their entire website to address their views on the “climate crisis”, whereas

several of the major business networks use only a fraction of their website to address green transition. Furthermore, the sections of the websites addressing the five above-mentioned keywords differ from actor to actor. Therefore, an automated harvesting of text from the same subsections of the websites would be insufficient. Thus, contrary to Venturini et al.'s seminal *CorText*-based study comparing rather uniform climate reports from the UN Framework Convention on Climate Change (2014), we have had to qualitatively excavate bits of exemplary text from the selected actors' websites. This has required browsing each of the websites and keeping a comprehensive log of the sub-sites found to be representative of the actors' self-representation. To obtain symmetry in the comparison, we have selected text with the length of 4000-6000 characters.

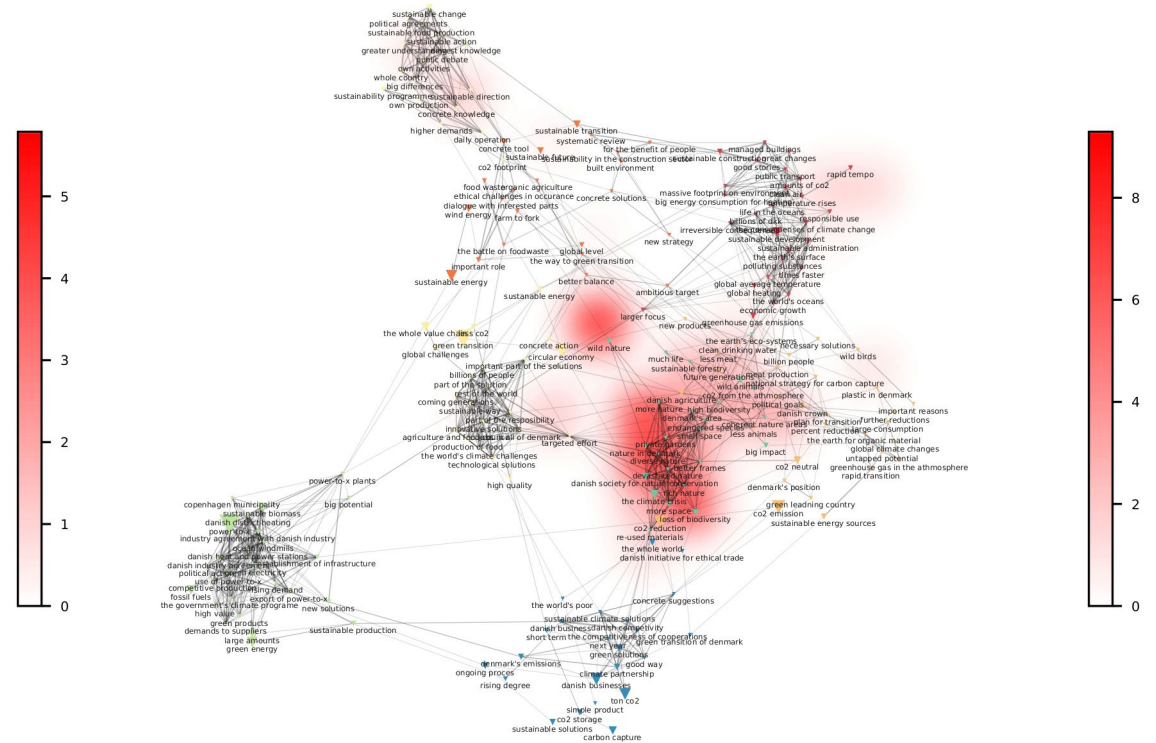
By assembling the texts in a .csv-dataset we gain a basis for comparing how actors use different semantics to represent their engagement and concerns regarding green transition. The dataset also includes information on what *Gephi*-detected "community" each actor belongs to and a description of where the text material is harvested from. We used the *CorText* 'terms extraction' script to parse the dataset at 'document level', thus detecting how the terms are connected to each other across the texts of different actors (the minimum frequency is set to 2, meaning that a term must be mentioned in the text of two actors). By running the 'Map heterogenous networks'-script, we generated a map where the node sizes indicate the number of times each term is mentioned (*frequency*), and the edges represent how their mentioning is connected to other terms. Figure 7 shows the network imported into *Gephi* with the terms translated to English.



Heatmap, Cluster 1 (blue) Energy & supply



Heatmap, Cluster 2 (green) Nature NGOs



Heatmap, Cluster 5 (red) Climate activism

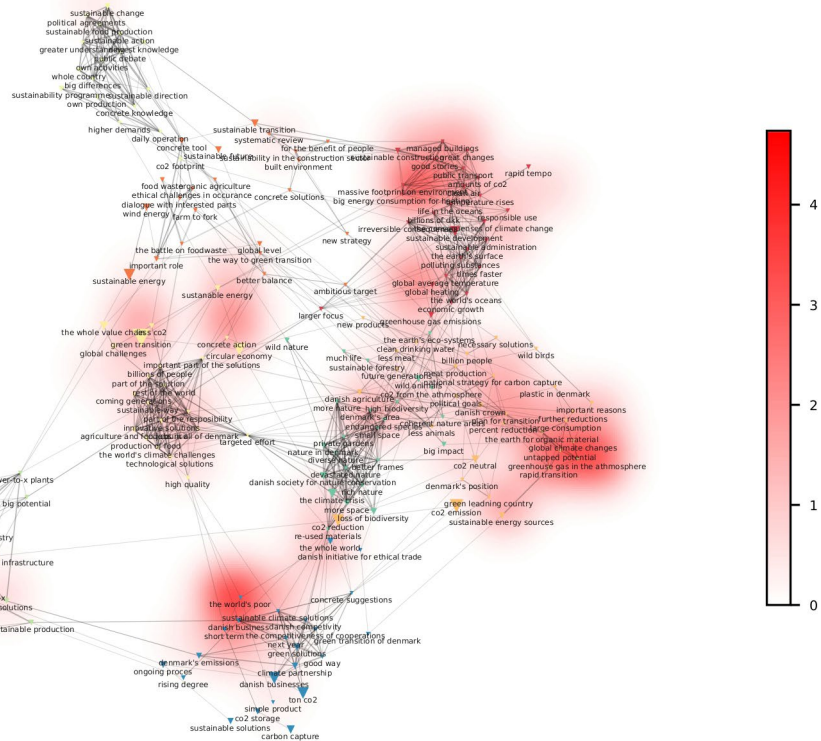


Figure 8. A collection of heatmaps showing how the mentioning of the terms detected and visualized through the CorText scripts ‘terms extraction’ and ‘map heterogenous networks’ are distributed across the different clusters of actors detected in Gephi (see figure 3).

The heatmapping shows that energy companies primarily focus on “Power-to-X” technologies (mentioned 38 times in the corpus) and “green energy”. This is what climate change is about to them. The construction industry’s concerns are in the southern (“Danish businesses”, “ton CO2”, “Carbon Capture”-technologies) and northern (“green transition”) parts of the network. The concerns of the agricultural industry – famous for opposing all attempts at curbing their CO2 emissions (Hastrup et al. 2022) - are located in the center of the network centered around one of the most mentioned terms in the network, “green transition” (46 mentions), with a further focus on being “part of the solution” with “innovative” and “technological” solutions. In the eastern tip, concerning “sustainable change” in relation to “food production” and “political agreements”, the green nature NGO’s use terms such as “climate crisis” and “loss of biodiversity”, whereas the organizations focusing narrowly on climate change are spread among the other clusters but most concentrated in the north-eastern edge of the network. Notably, they mention “fossil fuels” but none of the tech-oriented terms widely used in the energy sector cluster. Instead, they connect “sustainable energy sources” to “global climate changes”, “greenhouse gas in the atmosphere”, and “rapid transition”. Part of the reason for the distributed semantics of this cluster might be that several of its actors (most evidently klimaradet.dk) work by providing scientific commentary on a wide array of climate initiatives instead of focusing on singular issues.

Overall, the heatmapping shows considerable divergencies in how the actors relate to the green transition. While the business actors gravitate toward the promise of new technologies as the solution to the climate crisis, the NGO’s of the red and green cluster are concerned with defining the crisis as political and urgent, while to a lesser extent pointing to concrete solutions. Here, the conflictual nature of the political situation comes to the fore, as the civil society actors use strong, critical and problem-oriented language, while the business actors reveal a solutionist focus on new technologies, many of which are still immature or have yet to be developed. This articulation reflects the

government's discourse on climate change, a central element of which has been the so-called 'hockey stick'⁴ introduced by the ministry of finance: instead of a gradual reduction of CO₂-emissions from 2019 to 2030 through the implementation of currently available technologies combined with political regulation, Danish green politics should, in order to avoid an "unnecessarily expensive" green transition, put its investments on hold until close to 2030 when a (potential) selection of new technologies will make emission-reduction more cost-efficient (Kildegaard 2022, Bahn 2020).

Discussion and concluding remarks

Through the digital network mapping we have painted a picture of the political situation around climate change in Denmark as divided in two clusters, each with its own problem definitions and visions of what green transition entails, and each rather incommensurable with the other. We will now return to Mazzucato's call for establishing a green entrepreneurial state, and - keeping in mind the Danish Government's claim that Denmark "must be known as a green, entrepreneurial nation" (Regeringen 2020: 8) - we ask to what extent, and for whom, this has been attained? While civil society has been instrumental in making climate change a politically salient topic, the general public's influence on the agenda has been marginal since the election, at least compared to the business-oriented government's Climate Partnerships and the corporate partnerships' success in shaping Danish green politics. In a recent article, Voldsgaard, Mazzucato and Conway describe these partnerships as a step in the right direction, as they see the state assuming a role not just as 'market fixer' but as 'market shaper' "with a vision for the directionality of change" (2022: 10). Based on our mapping, we would, against Voldsgaard et al's more optimistic reading, posit that, rather than seeing the state as a 'market shaper', it seems

⁴ Not to be confused with the seminal, and hotly debated, climate model referred to as 'the hockey stick curve' illustrating the relation between human-generated greenhouse gases and rising temperatures over time (see Edwards 2010).

that the consultation process has put the Danish business sector in the position of a 'state shaper', as they have succeeded in leaving large fingerprints on the state's approach to the green transition.

For example, only in the summer of 2022, the Government decided to impose a tax on industrial carbon emissions, although experts - including the Government's own expert council The Climate Council (Klimarådet 2021, 2022) - and the constituted voice of civil society, the Citizen's Assembly on Climate Issues (KEFM 2021, 2022) - have suggested CO₂ taxes as their foremost initiative for a sound green politics from day one. The CO₂ tax that the Danish parliament finally agreed on in 2022 was both late and lower than what proponents had argued. This is no doubt due to push-back from the corporate partnerships. When they handed in their catalogue of ideas in 2020, CO₂ taxes were blatantly missing, and not surprisingly so, given the fear among Danish businesses that a tax on CO₂ emissions would compromise their competitiveness (Gjerding 2020). At the same time, the single largest CO₂-emitting company in Denmark, the concrete factory Aalborg Portland, was, together with other companies in the construction industry, awarded a remarkably large discount of almost 25% of the general CO₂ tax (Sæhl & Jensen 2022).

Moreover, the demands for the agricultural sector to reduce its emissions were cut to 55-65 percent, instead of the 70 percent goal impacting the rest of society (FVM 2022). The initiatives to reach this CO₂ reduction heavily prioritize the adoption of new technologies rather than reducing the CO₂-intensive livestock production, as major NGO's (Greenpeace 2019, Forum for Food Sovereignty 2017) and the Citizen's Assembly (KEFM 2022) suggest. These policies clearly align with the concerns of the business cluster, while being at odds with the interests of civil society.

In these two cases, politicians (Gjerding & Bahn 2021) and industry leaders (Danish Agriculture and Food Council 2022, Dansk Industri 2020) have raised the same argument for their compromised climate politics, namely the fear of a "leakage effect", where actors in other countries with less CO₂-efficient production methods would

take over and make the global climate situation worse. The supposed problem of carbon leakage is debated in the Danish public and in the academic literature (Hastrup et al. 2022) and is beyond the scope of this article, but it emphasizes the landscape visualized in our maps: Danish industry and businesses, and not the grassroots-based public, have become the most influential voices in the Danish green transition.

Harking back to the “guiding principles” of the Climate Act, 1) global leadership, 2) cost-efficiency by “developing and not dismantling the Danish businesses”, 3) balancing green transition and welfare state policies, and 4) securing that Danish CO₂-reductions are not “leaked” (Climate Act 2020 §1), as well as the long-term climate political strategy of “A Green and Sustainable World”, it is evident that policymakers are preoccupied with securing solutions that above all consider the interests of industry a main driver for the green transition, whereas the voices, demands and knowledge of civil society and experts are frequently overlooked.

While the government stipulates its ambitions of “green entrepreneurship”, the question is if it is currently taking the necessary measures to reform the state from a competition state (Cerny 1997, Pedersen 2011), a facilitator of export and financial growth, to a green entrepreneurial state, as “an ideational state model commensurate with the net-zero emission targets that advanced economies must make rapid strides towards” (Voldsgaard et al. 2022: 8).

Our findings echo Voldsgaard et al.’s analysis in that we also observe how “the logic and practices of the competition state are still embedded in [the state’s] institutions” (ibid: 8), thus hindering a necessary rapid green transition that the state is claiming to strive toward, through a “status quo embedded in and upheld by institutions that select which problems we prioritize to solve and the tools we try to solve them with” (ibid: 13).

Our study adds to this diagnosis that even when the government has sought to go beyond its established institutions and organizational tools in the name of green entrepreneurship, inviting both corporations and civil society representatives into rather experimental organizational

arrangements, the consequent moves made by the state still align with the interests and wishes of the corporate world, while civil society voices are routinely neglected or overheard. It would seem, paraphrasing Marres and Rogers’ seminal article on public issues and their digital lives, *Subsuming the Ground* (2008: 274), that as climate change and green transition, originally a cause for grassroots organizations, was adopted as a concern for the Danish industrial elite, ‘issue definitions were exchanged for institutionally-oriented, more corporate issue framings, both off and on the Web’.

References

- Adamic, L. A. & Glance, N. (2005). The political blogosphere and the 2004 US election: divided they blog. *Proceedings of the 3rd international workshop on Link discovery*: 36-43.
- Bahn, M. (2020). ”Wammens »hockeystav« er et fikst sprogbillede. Men det er en dårlig klimaløsning. Information 26/9 2022: <https://www.information.dk/indland/2020/09/wammens-hockeystav-fikst-sprogbillede-daarlig-klimaloesning>. Accessed 29/8 2022.
- Barry, A. (2013). *Material politics: Disputes along the pipeline*. John Wiley & Sons.
- Barry, A. (2012). Political situations: Knowledge controversies in transnational governance. *Critical Policy Studies* 6(3): 324-336. DOI: <https://doi.org/10.1080/19460171.2012.699234>
- Blondel, V., Guillaume, J.-L., Lambiotte, R. & Lefebvre, E. (2008). Fast unfolding of communities in large networks. *Journal of Statistical Mechanics: Theory and Experiment* (10). DOI: 10.1088/1742-5468/2008/10/P10008
- Callon, M. (1989). Society in the Making: The Study of Technology as a Tool for Sociological Analysis, in W. E. Bijker, T. P. Hughes & T. Pinch (eds.) *The Social Construction of Technological Systems*: 83–103. Cambridge, MA: MIT Press.

- Cerny, P.G. (1997). Paradoxes of the Competition State: The Dynamics of Political Globalization. *Government and Opposition* 32(2): 251–274. DOI: <https://doi.org/10.1111/j.1477-7053.1997.tb00161.x>
- Chakrabarti, S. (2002). *Mining the Web: Discovering knowledge from hypertext data*. Morgan Kaufmann.
- Collins, H. M. (1981). Son of seven sexes: The social destruction of a physical phenomenon. *Social studies of science*, 11(1): 33-62.
- CONCITO (2019). <https://concito.dk/nyheder/concito-hils-er-16-nye-medlemmer-velkommen>. Last accessed 30/8 2022.
- CONCITO (2021). <https://concito.dk/concito-bloggen/svar-paa-kritik-store-klimadatabase>. Last accessed 30/8 2022.
- Dansk Industri (2020b). Aalborg Portland: Energifgift vil bremse vores grønne omstilling. <https://www.danskindustri.dk/di-business/arkiv/nyheder/2020/11/aalborg-portland-energifgift-vil-bremse-vores-gronne-omstilling/>. Accessed 25/8.
- Dansk Industri (2022b). DI mener: National klimapolitik. <https://www.danskindustri.dk/politik-og-analyser/di-mener/klima/klimapolitik/>. Accessed 29/8 2022.
- Dansk Industri (2022a). DI: Nu skal vi tage de rigtige værktøjer i brug i den grønne omstilling. <https://www.danskindustri.dk/om-di/kontakt-os/presse/arkiv/pressemeddelelser/2022/2/di-nu-skal-vi-tage-de-rigtige-varktøjer-i-brug-i-den-gronne-omstilling/>. Accessed 27/8 2022.
- Dansk Industri (2020a). Klimapartnerskaberne har nu offentliggjort deres anbefalinger til regeringen. <https://www.danskindustri.dk/politik-og-analyser/di-mener/miljoenergi/nyheder-fra-miljo-og-klima/2020/032/klimapartnerskaberne-har-nu-offentliggjort-deres-anbefalinger-til-regeringen/>. Accessed 1/9 2022.
- Danish Agriculture and Food Council (2022). "L&F: Fokus bør være på reel grøn omstilling. <https://lf.dk/aktuelt/nyheder/2022/februar/l-f-fokus-boer-vaere-paa-reel-groen-omstilling>. Accessed 28/8 2022.
- Danish Climate Act (2020). <https://www.retsinformation.dk/eli/lta/2020/965>. Accessed 30/8 2022.
- Edwards, P. N. (2010). *A vast machine: Computer models, climate data, and the politics of global warming*. MIT press.
- Epstein, S. (1996). *Impure science: AIDS, activism, and the politics of knowledge*. Berkeley: University of California Press.
- Erhvervsministeriet (2019). Bekendtgørelse om årsregnskabsloven. <https://www.retsinformation.dk/eli/lta/2019/838>. Accessed 30/9 2022.
- Erhvervsministeriet (2023). Kommissorium for Klimapartnerskaber. <https://em.dk/media/13420/klimapartnerskaber-kommissorium.pdf>. Accessed 17/2 2023.
- Forum for Food Sovereignty (2017). *Madsuverænitet – Hvem skal bestemme over vores mad?*: <https://noah.dk/sites/default/files/2017-05/Madsuver%C3%A6nitet%20%E2%80%93%20Hvem%20skal%20bestemme%20over%20vores%20mad%3F.pdf>
- Gjerding, S & Bahn, M. (2021). "Det er en myte, at klimakrav til landbruget blot flytter udledningen til udlandet". Information 22/9 2021. <https://www.information.dk/indland/2021/09/myte-klimakrav-landbruget-blot-flytter-udledningen-udlandet>. Accessed 30/8 2022.
- Gjerding, S. (2020). Ingen klimapartnerskaber foreslår det mest effektive klimainstrument: en høj dansk CO2-afgift. Information 20/3 2021. <https://www.information.dk/indland/2020/03/ingen-klimapartnerskaber-foreslaar-mest-effektive-klimainstrument-hoej-dansk-co2-afgift>. Last accessed 30/8 2022.

- Greenpeace (2019). Halvt så mange køer og svin. <https://www.greenpeace.org/static/planet4-denmark-stateless/2019/05/c0d4c724-halvt-sa%CC%8A-mange-k%C3%B8er-og-svin.pdf>
- Hajer, M. A. (1997). *The Politics of Environmental Discourse: Ecological Modernization and the Policy Process*. Oxford University Press.
- Hannestad, A. (2021). "Dan Jørgensen: Fin rapport. Vi er allerede i gang med at justere". Politiken 26/2 2021. <https://politiken.dk/klima/art8116920/Fin-rapport.-Vi-er-allerede-i-gang-med-at-justere>. Accessed 22/8 2022.
- Hastrup, F., Bricchet, N., & Nielsen, L. R. (2022). Sustainable Animal Production in Denmark: Anthropological Interventions. *Sustainability* 14(9): 5584. DOI: <https://doi.org/10.3390/su14095584>
- Henare A., Holbraad M. & Wastell S. (2007). Introduction. In: Henare A., Holbraad M. & Wastell S. (eds.) *Thinking Through Things: Theorizing Artefacts Ethnographically*. London: Routledge: 1-31
- Horst, M. & Irwin, A., (2010). Nations at ease with radical knowledge: On consensus, consensusing and false consensusness. *Social Studies of Science*, 40(1): 105-26.
- Jacomy, M. (2020). Epistemic clashes in network science: Mapping the tensions between idiographic and nomothetic subcultures. *Big Data & Society* 7(2). DOI: <https://doi.org/10.1177/2053951720949577>
- Jacomy M., Venturini T., Heymann S. & Bastian M. (2014). ForceAtlas2, a Continuous Graph Layout Algorithm for Handy Network Visualization Designed for the Gephi Software. *PLoS ONE* 9(6). DOI: <https://doi.org/10.1371/journal.pone.0098679>
- Jacomy, M., Girard, P., Ooghe-Tabanou, B. & Venturini, T. (2016). Hyphe, a curation-oriented approach to web crawling for the social sciences. In *Tenth International AAAI Conference on Web and Social Media*. DOI: <https://doi.org/10.1609/icwsm.v10i1.14777>
- Jacomy, M. (2021). *Situating Visual Network Analysis*. Aalborg Universitetsforlag. Aalborg Universitet. Det Humanistiske Fakultet. Ph.D.-Serien.
- Jaffee, D., Howard, P.H. (2010). Corporate cooptation of organic and fair trade standards. *Agric Hum Values* 27: 387-399. DOI: <https://doi.org/10.1007/s10460-009-9231-8>
- KEFM (2021). Danmarks Klimaborgerting afleverer 117 anbefalinger til Christiansborg. <https://kefm.dk/aktuelt/nyheder/2021/apr/danmarks-klimaborgerting-afleverer-117-anbefalinger-til-christiansborg>. Accessed 20/8 2022.
- KEFM (2022). Borgertinget på Klimaområdet – Borgertingets anbefalinger, anden samling. <https://kefm.dk/Media/63781033123086622/Borgertingets-anbefalinger-anden-samling.pdf>. Accessed on August 13th.
- Kildegaard, K. (2022). »Bekymret« finansminister advarer nu mod »utroligt dyr« vej mod klimamål: »Vi skal tænke os om«. In: *Berlingske* 23/9 2022. <https://www.berlingske.dk/politik/bekymret-finansminister-advarer-nu-mod-utroligt-dyr-vej-mod-klimamaal-vi>. Accessed d. 29/8 2022.
- Klimarådet (2021). Statusrapport 2021. <https://klimaraadet.dk/da/rapporter/statusrapport-2021> (incl. English summary)
- Klimarådet (2022). Statusrapport 2022. <https://klimaraadet.dk/da/rapporter/statusrapport-2022>
- Latour, B. & Woolgar, S. (1986). *Laboratory life – The construction of scientific facts*. Princeton, NJ: Princeton University Press.
- Latour, B. (2004b). On using ANT for studying information systems: a (somewhat) Socratic dialogue. C. Avgerou, C. Ciborra & F. Land (eds.): 62-76.
- Latour, B. (2005). *Reassembling the Social: an Introduction to Actor-Network-Theory*. Oxford: Oxford University Press.

- Latour, B. (2004a). Why has critique run out of steam? From matters of fact to matters of concern. *Critical inquiry* 30(2): 225-248. DOI: <https://doi.org/10.1086/421123>
- Marres, N. (2017). *Digital Sociology: The Reinvention of Social Research*. Cambridge: Polity.
- Marres, N. & Rogers, R. (2005). Recipe for Tracing the Fate of Issues and their Publics on the Web, in B. Latour & P. Weibel (eds.) *Making Things Public*: 922–35. Cambridge, MA: MIT Press.
- Marres, N & Rogers, R. (2008). Subsuming the ground: How local realities of the Fergana Valley, the Narmada Dams and the BTC pipeline are put to use on the Web. *Economy and Society* 37(2): 251-281, DOI: 10.1080/03085140801933314
- Marres, N. (2012). The redistribution of methods: on intervention in digital social research, broadly conceived. *Sociological Review* 60: 139-165. <https://doi-org.ep.fjernadgang.kb.dk/10.1111/j.1467-954X.2012.02121.x>
- Marres, N. (2015). Why Map Issues? On Controversy Analysis as a Digital Method. *Science, Technology & Human Values* 40(5): 655–686. DOI: 10.1177/0162243915574602.
- Mazzucato, M., Kattel, R., & Ryan-Collins, J. (2020). Challenge-driven innovation policy: Towards a new policy toolkit. *Journal of Industry, Competition and Trade* 20: 421-437.
- Mazzucato, M. (2015). The green entrepreneurial state, in I. Scoones, M. Leach and P. Newell (eds.) *The Politics of Green Transformations*. Earthscan from Routledge.
- Ministry of Food, Agriculture and Fisheries. (2022). The agreement on a green transition of the agricultural sector. <https://en.fvm.dk/focus-on/the-agreement-on-a-green-transition-of-the-agricultural-sector/>. Accessed 23/8 2022.
- Moretti, F. (2013). "Operationalizing": or, the function of measurement in modern literary theory. Stanford Literary Lab. Pamphlet 6.
- Munk, A. K. (2019). Four Styles of Quali-Quantitative Analysis: Making sense of the new Nordic food movement on the web. *Nordicom Review*, 40(1): 159–176. DOI: <https://doi.org/10.2478/nor-2019-0020>
- Munk, A K. (2014). Mapping Wind Energy Controversies Online: Introduction to Methods and Datasets. *SSRN Nordic Journal*. DOI: <https://dx.doi.org/10.2139/ssrn.2595287>
- Ooghe-Tabanou, B., Jacomy, M., Girard, P. & Plique, G. (2018). Hyperlink Is Not Dead. *Proceedings of the 2nd International Conference on Web Studies*: 12–18. DOI: <https://doi.org/10.1145/3240431-3240434>
- Pedersen, O.K., (2011). *Konkurrencestaten*, Hans Reitzels Forlag, København.
- Pickering, A., (1984). *Constructing quarks – A sociological history of particle physics*. Edinburgh: Edinburgh University Press.
- Pinch, T.J. (1981). The sun-set: The presentation of certainty in scientific life. *Social studies of science* 11(1): 131-158.
- Regeringen (2020). A Green and Sustainable World – The Danish Government's long-term strategy for global climate action. København.
- Rogers, R. (2013). *Digital Methods*. Cambridge, Massachusetts: MIT Press.
- Rogers, R. (2012). Mapping and the Politics of Web Space. *Theory, Culture & Society* 29(4/5): 193–219. DOI: 10.1177/0263276-412450926
- Rogers, R. (2002). Operating Issue Networks On The Web. *Science as Culture* 11(2): 191–213. DOI: <https://doi.org/10.1080/09505430-220137243>
- Strathern, M. (1996). Cutting the Network. *The Journal of the Royal Anthropological Institute* 2(3): 517–535. DOI: <https://doi.org/10.2307/3034901>

- Sæhl, M & Jensen, K. B. (2022). Aalborg Portland får rabat på op mod en halv milliard efter ny grøn skatteaftale, DR.dk: <https://www.dr.dk/nyheder/viden/klima/aalborg-portland-faar-rabat-paa-op-mod-en-half-milliard-efter-ny-groen>. Accessed 30/7 2022.
- Venturini, T., Bounegru, L., Gray, J., & Rogers, R. (2018). A reality check(list) for digital methods. *New Media & Society* 20(11): 4195–4217.
- Venturini, T. (2012). Building on faults: How to represent controversies with digital methods. *Public Understanding of Science* (Bristol, England), 21(7), 796–812. DOI: /10.1177/09636625-10387558
- Venturini, T. & Munk, A. K. (2022). *Controversy Mapping: A Field Guide*. Cambridge, UK: Polity.
- Venturini, T. (2010). Diving in magma: How to explore controversies with actor-network theory. *Public Understanding of Science* 19(3): 258–273. DOI: <https://doi.org/10.1177/0963662509102694>
- Venturini, T., Baya Laffite, N., Cointet, J.-P., Gray, I., Zabban, V., & De Pryck, K. (2014). Three maps and three misunderstandings: A digital mapping of climate diplomacy. *Big Data & Society* 1(2): 205395171454380–19. DOI: <https://doi.org/10.1177/20539517-14543804>
- Venturini, T., Jacomy, M., & Jensen, P. (2021). What do we see when we look at networks: Visual network analysis, relational ambiguity, and force-directed layouts. *Big Data & Society* 8(1): DOI: <http://dx.doi.org/10.1177/20539517211018488>
- Voldsgaard, A., Mazzucato, M. og Conway, R. (2022) From Competition State to Green Entrepreneurial State: New challenges for Denmark, *Samfundsøkonomen* 2022(2). DOI: <https://doi.org/10.7146/samfundsokonomien.v2022i2.132832>
- Whatmore, S.J. (2009). Mapping knowledge controversies: Science, democracy and the redistribution of expertise. *Progress in Human Geography* 33(5): 587–98. DOI: 10.1177/0309132509339841

Willig, R. & Blok, A. (2021). *Den Bæredygtige Stat*. København: Hans Reitzels Forlag.

Wynne, B. (1992). Misunderstood misunderstanding: Social identities and public uptake of science. *Public Understanding of Science* 1(3):281–304. DOI: 10.1088/0963-6625/1/3/004.

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