STS ENCOUNTERS
Research papers from DASTS
Volume 6 · Number 1 · 2014

http://www.dasts.dk/

© Irina Papazu and Christian Elling Scheele, DASTS

ISSN: 1904-4372

(De-)Localising the Climate

The production of uncertain agencies through climate websites

Irina Papazu and Christian Elling Scheele

DASTS er en faglig forening for STS i Danmark med det formål at stimulere kvaliteten, bredden og samarbejdet inden for dansk STS-forskning samt at markere dansk STS tydeligere i nationale og internationale sammenhænge.

(De-)Localising the Climate

The production of uncertain agencies through climate websites

Irina Papazu and Christian Elling Scheele

This article introduces a device-centred approach to the concept of climate engagement through a qualitative analysis of two websites: www.klimabevidst.dk and www.mapmyclimate.dk. While klimabevidst.dk represents a down-to-earth take on individual engagement with the climate, providing users with hands-on guides to green home improvements, www.mapmyclimate.dk seeks to increase the user's awareness of the phenomenon of global climate change by demonstrating how the user's actions impact the earth's future. Using conversations with six individuals centred on these green technologies, we investigate how the scaling techniques employed by the websites impact the user's sense of agency vis-à-vis the climate. The analysis suggests that scales can indeed be changed or redefined in a way that is conducive to climate engagement.

Key words: climate change, engagement, green technologies

> Right now there is no path leading from my changing the light bulbs in my home straight to the Earth's destiny: such a stair has no step; such a ladder has no rung. I would have to jump, and this would be quite a salto mortale! All assemblages need intermediaries: satellites, sensors, mathematical formulae, and climate models, to be sure, but also nation states, NGOs, consciousness, morality and responsibility.
>
> (Latour, 2011: 7)

Introduction

If the climate has a fatal flaw, it is that we do not feel attached to it. We are, on the contrary, intimately attached to all the activities and practices of which climate change is an indirect consequence (Gomart & Hennion, 1999; Marres, 2007: 768; 774). Gomart & Hennion (1999) use the term *attachment* to denote a relation between human and non-human entities characterised by 'active commitment' and 'dependency'. The implication is that for people to become engaged, they must be 'ontologically implicated' (Marres, 2007: 774), that is, they need to feel attached to that which is threatened. In order for this feeling of threat to occur, the associations that make up the realities of everyday life must be under threat, rendering visible the deep attachments that are at stake, and thereby creating commitment and engagement (Marres, 2007: 774).

This paper is concerned with the achievement of public climate engagement, because to date and paradoxically, the threat posed to our livelihoods by the changing climate does not seem to possess the power to engage people. This should, however, come as no surprise. As Jasanoff adequately puts it: "*How… will scientists' impersonal knowledge of the climate be synchronized with the mundane rhythms of lived lives and the specificities of human experience?*" (2010: 238).

Whereas life is lived locally in the here and now, climate change is often depicted as a global problematic, the consequences of which will be felt in the future, someplace far away, if at all. Even mainstream communication about climate change is focused on stories about numbers and concepts that no one understands, i.e., constructing climate change as a scientific and international curiosity for people to be bemused and confused about as well as alienated from. Our attachments are not at stake, as we do not find ourselves ontologically implicated in the issue of climate change.

That being said, climate change is not a fixed entity. A fundamental insight of actor-network theory is that "*there are only local summings up*" (Latour, 1999); and thus no single globality in which climate change is taking place (Blok, 2010: 905). In the same vein, Blok describes climate change as '*a "hybrid" social reality, encompassing long chains of translation between human and nonhuman entities*' (2010: 898). The size, that is, the perceived complexity and globality of climate change, can then be understood as a result of actors' scaling activities, mirroring the early insight from actor-network theory that macro-actors are neither larger, nor more complex than micro-actors, '*macro-actors are micro-actors seated on top of many (leaky) black boxes'* (Latour & Callon, 1981: 286).

Twenty years after this statement, Latour laments the fundamental disconnect between the individual and the climate, arguing that '*it might be important, even urgent, to bring together all the possible resources to close the gap between the size and scale of the problems we have to face and the set of emotional and cognitive states that we associate with the tasks of answering the call to responsibility [to act] without falling into melancholia and denial*' (Latour, 2011: 11). Latour illustrates the problem of this gap through the metaphor of an incomplete ladder. According to the way climate change is most commonly understood today, life is lived in the bottom rungs of this ladder, while the climate exists in the top rungs. The in-between rungs are missing (Latour, 2011: 7).

It is this disconnect that we investigate in this article, relying on the possible silver lining that '*we should envisage a plurality of different* global climates' (Blok, 2010: 897). What does climate engagement that transcends this disconnect look like? Or, to turn the question around: How can we envisage a climate capable of overcoming the disconnect, and what will be the shape and size of this more relatable rendering of the climate? As Latour puts it, with a nod to his younger self: '*One of the solutions is to become attentive to the* techniques *through which scale is obtained and to the instruments that make* commensurability *possible*' (Latour, 2011: 5).

One way to *localise* the climate – to scale it down and situate it in the local realm - is to '*[locate] environmental engagement in everyday practices*' (Marres, 2011: 510). As our lives are defined by the mundane practices of the everyday, it follows that public engagement with the climate must become an '*embodied activity, taking place in particular locations and involving the use of specific objects and technologies* (Marres, 2011: 511), bringing the abstract climate 'down to earth', and endowing people with a sense that they relate to the climate directly through their everyday actions.

Drawing on insights from *Science and Technology Studies* (STS) – particularly resting on the projects of the above-cited authors who share an interest in the cosmopolitics and multiplicity of nature (see especially Blok, 2011; Marres, 2013; Latour, 2009; Gad & Jensen, 2010) - this paper explores whether and how climate engagement may be materialised and localised by means of green 'technologies of participation' (Marres, 2011: 515). By exploring how six ordinary Danish citizens relate to the climate, to each other, to two green websites and, inevitably, to the researchers, we aim to map the constellations of climate engagement that become visible and develop through these interactions. We ask the question: C*an green technologies strengthen engagement with the climate?* Our concern in this article is not to engage in a discussion of the scientific adequacy of the phenomenon of climate change. Instead of asserting the reality of this perceived challenge, we set out to explore how the climate

and issues related thereto are enacted and evoked through the use of the websites, asking: What does the climate problematic look like in this instance? Which actions do these enactments demand from the individual, and how does the individual evade or embrace these demands?

The road to climate engagement travels through complex entanglements of economy, social life, ethics, practicalities, and politics. In unpacking these entanglements, various fields of tension emerge, and our informants often lose their way in the confusing lines of reasoning that tend to emerge when discussing the problem of the climate. These tensions surface in the form of corroding dichotomies – a contested concept in STS to which we shall shortly return. Two of these - *near/far* and *powerless/empowered* – will structure the first two parts of the analysis, while in the last section we return to the idea of *attachment*. This rather overlooked concept, we shall show, lies at the heart of climate engagement. Being engaged with the climate means being willing to give up some of your deepest attachments, in this paper illustrated by the CO_2-intensive practice of flying. This indicates that the climate conscious life demands more of the individual than is often acknowledged; green everyday acts may not be sufficient if extremely CO_2-intensive practices are continued.

Green technologies of engagement

The term 'green technologies of engagement' may be broadly understood as all objects that contribute to the reduction of CO_2 emissions in an individual's everyday life. In this article, the green technologies under scrutiny are two Danish websites, www.klimabevidst.dk[1] and www.mapmyclimate.dk. Several studies (Barry, 2001; Marres, 2009; Hobson, 2006) have proposed that material and physical entities '*are not just passive objects of public or political concerns, but may acquire capacities to actively channel these concerns*' (Marres, 2008).

1 Translates as 'climate conscious'.

Such household technologies turn the home into a site of engagement with the climate, firstly through their physical presence, entering into heterogeneous networks with their users, and, secondly, through their creation of a connection between their users' everyday lives and the climate problematic, potentially forging a link between mundane everyday activity and the future of the planet.

In order for a green technology to create said engagement, it should relate the development of a new sensibility more effectively to the complexity of hitherto taken-for-granted practices of energy consumption. Locating climate engagement in everyday practices means enabling people to act climate consciously without having to deal with the wider complexities of a globalised climate science (Marres, 2011). This line of reasoning resonates well with the website www.klimabevidst.dk, whereas the aim of www.mapmyclimate.dk is, instead, to communicate the scientific facts and future consequences of the changing climate while seeking to position the user in the midst of these complex processes (Erichsen, 2010).

We explore in our analysis how green websites manage or fail to create a space in which our informants' climate engagement can be played out. We investigate which *climates* are produced by the websites and how different enactments of the climate problem result in different senses of agency towards the climate.

Experimenting with engagement

This paper is based on what may be termed a qualitative experiment in engagement. The experiment, conducted in February 2013, was comprised of three parts. First, the six participants (three men and three women, unacquainted with each other and experienced Internet users) were interviewed individually. In the interviews, the participant first talked about his or her views of climate change and whether and how the climate is part of the considerations and practices of his or her everyday life. Subsequently, the participant was

introduced to the websites, which he or she used and commented on, thinking aloud and reflecting on the functionalities and messages of the technologies of the individual websites. This part of the study took the form of 'surfing conversations' as described in Breddam and Jespersen (2010). In the second part of the experiment, the participants were contacted by email and asked to use the websites on their own. Within two weeks of the individual interviews, the final part of the experiment took the form of a focus group interview in which the participants, with our guidance, discussed their views on and relationship to climate change within the perspective of their experiences with the green technologies represented by the websites.

The main contribution of this inquiry is the exploration of different constellations of the climate and engagement with it, the websites functioning as producers of different renderings of the climate as well as mirrors reflecting the participants' engagements with and thoughts about the climate. The websites are characterised by such 'interpretive flexibility' (Bloor, 1976; Star, 2010: 602) as to allow each participant to meet his own reflection, his views, needs and limitations. This spaciousness revealed the users' practical shortcomings, disconnects, prejudices and senses of agency or lack thereof regarding climate change, and forced them to argue, justify and, at times, critically confront themselves, vowing to 'do better', or refusing to change.

What makes this inquiry experimental is related to the way in which our informants 'follow real-time experimental trials' (Gomart & Hennion, 1999: 230) through the introduction of the websites, testing different possible entries into the climate-implicated citizen identity, and the way this intervention *might* involve the reconfiguration of everyday socio-material relations, thus enabling the participants to reduce their CO_2 emissions in their everyday lives (Marres, 2009: 119).

Experimental devices: the green websites

A website creates a socio-technical network between itself and the user involving a range of actors from the servers it draws on and the internet connection that enables the user to access the site (with all the networks, protocols and routing involved in sustaining the black box of the Internet) to the user's computer, tablet or smartphone. One can view the website as an intelligent book displaying dynamic, user-dependent information reflecting the movements of the user while still framed and conditioned by the web design. The user is co-creating the web experience as she moves around. Both the websites under study here seek to push the user toward a less CO_2-intensive everyday life, but their conceptualisations - their enactments - of climate change vary distinctly. Whereas www.klimabevidst.dk (short: klimabevidst) contains action-oriented guides to help users reduce their CO_2 emissions, www.mapmyclimate.dk (short: mapmyclimate) is an advanced climate simulator, the main function of which is to illustrate the climate in Copenhagen in year 2100 *if everybody* had the same carbon footprint as the user.

Klimabevidst provides a catalogue of more than 200 energy reduction guides, which can be used as recipes for climate-related action in different spheres of everyday life. The categories include, among many others, *lighting*, *transport* and *consumption and lifestyle*. Some of the advice contained in the guides appears readily accessible; other advice is more demanding. The guides contain simple step-by-step instructions making it possible for users without prior knowledge of green home improvements to carry out the initiatives. Furthermore, the guides provide information about the potential financial savings connected to the proposed changes. Klimabevidst's aim is to simplify energy reduction initiatives (suggestions range from the simple 'switch off the light!' to the more complicated 'replace your windows with low-energy windows' or 'put up a mini wind turbine and produce your own CO_2-free electricity'), CO_2 reductions and potential financial gains. The illustration below is a screenshot of one of klimabevidst's energy reduction guides (in Danish).

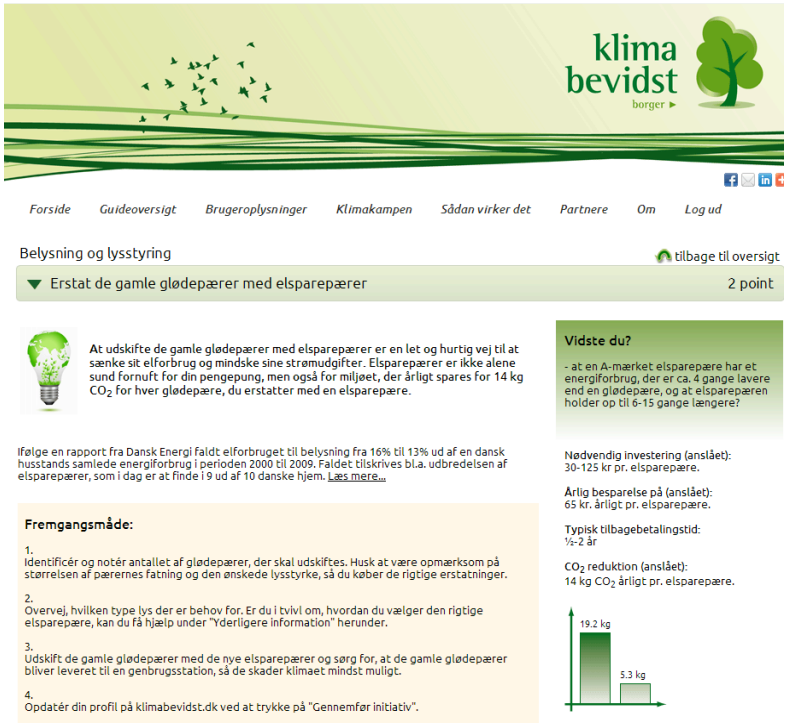

***Fig. 1**: www.klimabevidst.dk*

Mapmyclimate was originally developed as a communication tool to mark the COP15 climate summit held in Copenhagen in 2009. The site was to function as an eye opener, as the developers believed that the first step towards a less CO_2-intensive lifestyle is a deeper understanding of how temperatures and water levels will rise as consequences of a changing climate (Erichsen, 2010). Mapmyclimate is a climate simulator that shows the user which areas of Copenhagen will be flooded by 2100 as a consequence of the user's current energy consumption *if everybody* had the same energy consumption profile as the user. The website also provides a visual of the increase in average summer temperatures, water temperatures, and the development of toxic algae in the waters around Copenhagen. The algorithms underlying the website require users to report numbers

relating to various everyday practices which are said to affect the climate, e.g., yearly heat and energy consumption of the household, transport habits, food choices and monthly consumption of non-food products. The user's CO_2 profile is aggregated on this basis, the website indicates the climatic consequences of the user's lifestyle choices and provides an estimate of the user's yearly carbon emissions.

***Fig. 2**: www.mapmyclimate.dk, a satellite photo of a flooded Copenhagen anno 2100.*

Rough sketch of a concept of climate engagement

Let us introduce the two dichotomies which structure two-thirds of the analysis. It is in the frailty of these dichotomies, i.e., their inherent inability to remain standing, that the contours of a lay citizen

engagement with the climate surfaces. Employing dichotomies as analytical categories may appear controversial in the light of Latour's '*fierce fight*' (Latour, 2005: 213) against this way of structuring our understanding of society, but it is our argument that these distinctions come into being as effects of the websites' design and our informants' use of them. These are not stable dichotomies that stay in one place; they are by turn productive and destructive states which create and prevent each other's conditions of being. Paraphrasing Candea, '*the categories (e.g., near and far) emerge as opposed performative projects rather than as figure and ground*' (2011: 321).

The two dichotomies are:

Near/far: This dichotomy relates to Latour's image of the ladder with no rung. With one website (klimabevidst) situated firmly in the intimacy of our everyday lives and the other (mapmyclimate) focused on the geographically near but temporally far-off consequences of the user's actions, mapmyclimate conjures up the image of Latour's incomplete ladder, effectively placing the individual's life far from the global climate, while klimabevidst situates climate action on the bottom rungs of the ladder. The tensions of the dichotomy created by these opposing scaling activities vibrate in the participants' statements, which oscillate between concerns about their own lives and the future of the planet. Often one sentence by a participant of this experiment contains elements from both sides of the dichotomy, illustrating its inevitable break-down.

Empowerment/Powerlessness: This theme revolves around the roller-coaster ride of emotions and sense of agency or lack thereof experienced by participants using the websites. The participants shuttle between a sense of empowerment, e.g., feeling enthusiastic about buying water nozzles to save water, and a sense of utter impotence in the face of the climate, which is alternately large and small, depending on which site and which function on the site the informant is using. The dichotomy is to a degree a facet of the above near/far dichotomy. The sense of empowerment is often connected to klimabevidst's rendering of the climate as something you relate to in the nearness of your everyday life, whereas a despairing attitude is a frequent reaction to mapmyclimate's abstract invocations of increasing temperatures and CO_2 levels in the atmosphere, suggesting that climate engagement thrives at the bottom rungs of the ladder.

However, with climate change, the local and the global are inevitably entangled and it is not possible to purify one's positions, i.e., to hold one position and not the other. As no one can inhabit any of these places fully, we are forced to be in-between, and it is this in-between-ness, as we shall show, that contains both possibilities and challenges when it comes to '*taking responsibility without falling into melancholia and denial*' (Latour, 2011: 11).

Near / Far

In order to make sense of our participants' reactions to the websites, we must first examine their discourses concerning the climate (Michael & Brown, 2005): How do our participants view climate change and in what sort of space of action or inaction do they place themselves - *before* their encounter with the websites? In many cases the participants' dilemmas can be boiled down to the fact that the more comprehensive their knowledge of global climate science, the more feeble their sense of personal agency. Scales, it seems, overwhelm.

> Interviewer: How big a problem do you think the climate changes will create?
> Bill: Well, they'll come. They'll come and they'll be big, and they'll probably be here a lot sooner than we think… They say sea levels will rise by 60 centimetres the next couple of years and I believe that to be true.

> De-glaciation seems to be going fast. The problem is that no one has been here before, we have not had this type of climate change before, but we know from other studies that climate change will occur sooner than most anticipate, which also has to do with self-perpetuating effects. We are moving into uncharted territory.
> Interviewer: But then why don't you do something yourself to battle climate change?
> Bill: I kind of think of it this way: 'Argh, but what can I do about it?'
>
> (Bill: 4)

This participant is obviously in possession of a detailed scientific knowledge regarding climate change, and he is not afraid to show it. However, when it comes to his everyday life he claims not to know what to do. Bill has, so to speak, leapt to the far end of the Latourian ladder and has stocked up on so much *knowing what* that there is little room left for *knowing how*. When relating to the climate becomes a question of rattling off scientific facts, the level of abstractness seems to prevent a localised, down-to-earth relation to the climate as a problem embedded in the practices of everyday life. Whether Bill is simply hiding behind a shield of knowledge in order to avoid taking concrete action or whether he truly feels unable to act remains an open question, of course. Furthermore, as Bill puts it, the climate changes '*will be big*'. Not only is the phenomenon far from his everyday life, but its sheer size overwhelms him.

Dana, on the other hand, feels '*afraid*' and '*worried*' about climate change, but is also sceptical, stating that she finds the idea that human beings can '*trash the planet in 500 years'* arrogant. She does not follow news stories about climate change because she does not like the way the media '*induce fear*' (Dana: 1). Somewhat paradoxically, while refusing to *know what* (although she seems to have more knowledge on the subject than she expresses), she certainly *knows how*, embedding concerns about the climate in the way she lives her life:

> Dana: Sustainable living is my lifestyle. I want to live in a super-ecological house with solar energy and everything. Then I would be completely self-sufficient. If I only had the money for it… I don't want to overspend. I try to devote myself to not owning too much and instead focus on treating myself well. It might sound holy, but…
>
> (Dana: 3)

Dana feels personally implicated in the climate problematic to such an extent that she, during our one-hour interview, mentions her '*bad conscience'* 19 times. At the same time, she claims to have dismissed and disconnected the top rungs of the ladder, the global-scientific layers, focusing solely on life inside her '*own little bubble'* (Dana: 6). In Bill's and Dana's discourses, '*knowing'* excludes '*doing'* or vice versa. Dana works hard to keep the large-scale climate out, via the realisation that the complexity of the challenge will make it hard for her to keep up her *'little'* climate conscious life. The bigger the climate gets, the smaller the individual; this is the work that scales do. Knowing becomes related to the global facts of climate change while doing becomes a strictly local endeavour.

In Joe's articulations we see more of an oscillation, a constant movement between the global and local levels of the problematic:

> Interviewer: What is your view on climate change?
> Joe: I definitely believe that something must be done and that it should be done now!You know, when people go: 'I can't do anything in this big world', that is not really true, because there is a kind of movement in the world: if you want something and you are able to persuade other people, then it just accelerates. So I do

think about it. I also think, for example, about electric bulbs: 'Okay, which ones should I choose?'

(Joe: 1).

Joe manages a rather smooth move from expressing the urgency of stopping climate change, to stating his belief in the rise of social movements combating global climate change, to his everyday reflections on light bulbs. This movement conjures up Latour's ladder; recall the quote: '*Right now there is no path leading from my changing the light bulbs in my home straight to the Earth's destiny…*' (Latour, 2011: 7). Joe's scale-making activity, i.e., his movements from the complex to the mundane, do not, however, respect the linearity implied by the image of the ladder. Rather, Joe folds the local and the global into each other, and makes no effort to keep them apart. To him, it seems, there are indeed only local summings up, which is reflected in his faith in '*a kind of movement in the world*' and the statement: *'[My actions] might only matter 0,00001 per thousand or something, but of course my actions matter. Yeah, I definitely have the impression that they do. If everybody just saves a little bit, then it'll amount to a lot*' (Bill: 2-3).

Joe's optimism is, however, fragile, exactly because it is rooted in his belief that individual actions matter. This great summing up of '*everybody*' into a 'collective *giant*' (Latour, 2011: 3) prepared to act in concert to prevent climate change is a fragile construct, and Joe is only confident of the impact of his actions as long as climate change is imagined as a challenge to be handled locally, by changing light bulbs or windows around the house. When confronted with the website mapmyclimate, he, as we shall see, quickly loses faith in his own impact.

In the focus group interview, the members of the group seem to change their focus from the local to the global level whenever a sense of personal responsibility starts to weigh heavily in the conversation, mirroring Latour's comment: '*Why [do] we feel so guilty about having committed crimes for which we feel no responsibility…?*' (Latour, 2011: 4):

Dana: Well, do you think that we can do anything about it? What can we do?
Bill: Well, it's my mother's responsibility; she founded a travel agency in 1959, haha…
Rose: But we all have an individual responsibility, right? We could all do much more, we could take it much more seriously and…stop driving cars and take shorter showers and…Somehow I wish we all did so much more. Because I think it would have an effect, and it would also make you more conscious. I think it would kind of vibrate and evolve…
Robert: But who is responsible when we don't do all those things? Do we have to hold ourselves responsible? It becomes a kind of vicious circle.
Rose: I think the politicians have a huge responsibility, they keep talking about how much CO_2 we emit and that the oceans will rise to a point where Holland and the Maldives will be lost. And then they make these CO_2 quota trading systems and turn air into something that you can make money off, I mean, on the global political level, it has no real effect… Ehm, and I don't know if it would have any real effect if we emit less CO_2. There are just as many theories that claim that CO_2 doesn't have a real effect and that human beings aren't behind the current global warming.

(Focus group: 12)

Here, national and global politics, geography, air (CO_2) and competing theories are whirling around, crowding out and overtaking individual responsibility and the good intentions of changing everyday practices. CO_2, politicians and '*global warming*' are brought up when

the climate comes too close, threatening to reconfigure everyday realities as it is imagined first, in terms close to home. Rose ends up expressing a version of climate scepticism as a way of rejecting responsibility, a stark contrast to her opening remarks about the potential of individual and collective action.

In the same way, the group creates a 'climate' that grows and grows. First, the picture of Bill's mother's travel agency is invoked, but soon the climate can only be dealt with at '*the global political level*', if it can even be trusted to be '*real*'. In a similar manner, Bill, in the quote in the beginning of this section, turns to scientific facts, thereby defining the climate in terms of *the global*: something that cannot be reached through everyday, local actions.

The websites, as mentioned, have markedly different takes on where and how they situate the individual user vis-à-vis the climate. While klimabevidst displays a 'what's in it for me' approach, emphasising the financial gains of the proposed green investments and thereby depicting the climate as something directly amenable to the user's actions, mapmyclimate's aim is to situate the user within the scientific realm of global climate change. In a simplifying movement, one might propose that klimabevidst has adopted the 'near' approach, while mapmyclimate represents a 'far' approach to the climate, and that neither takes on Latour's challenge of creating a path from everyday action to the global climate. This begs the question of whether this '*disconnect*' (Latour, 2011: 7) is in fact a precondition for a localised climate engagement. Does it follow that it might be better to suspend the universal, scientific viewpoint of the global climate in order to move the masses to achieve global goals? First, let us look in more detail at the websites and their effects.

Empowerment / Powerlessness

Mapmyclimate is a contradictory machine. On the one hand, it acts as a magnifying glass by enlarging the user's climate impact, confronting the user with the long-term consequences of her actions *if everyone had the same energy consumption profile* - a thinly veiled reference to the Kantian categorical imperative. The website implies that the view of a flooded Copenhagen, the algae-filled waters, and the increase in average temperatures in a hundred years are all the user's doing and can be traced back to her lifestyle choices. In this way, the website attempts to create a direct link between the user's life and the global climate, but, as we shall see, this is not the lasting impression the website makes on the user.

For example, *the climate barometer* placed on the left side of the screen benchmarks the user's energy consumption profile against the climate scenarios and targets of the European Union (EU) and the United Nations' Intergovernmental Panel on Climate Change (IPCC). (These outputs are illustrated in Figure 3 below.) This juxtaposition of comprehensive climate scenarios and individual users' energy consumption communicates the user's smallness compared to these regional and global realms. As our participants entered their consumption data, they would typically end up in the orange-red end of the barometer, just below the IPCC 'worst case scenario'. Through the colouring of the climate barometer – ranging from benign blue-green to ominous orange-red – and the choice of words, including 'worst case scenario' and 'the CO_2 diet', equating a carbon intensive lifestyle with obesity, the website clearly points out that much is left to be done in the user's current way of life. As we shall see below, our informants see the website's assessment of their CO_2 impact as a moral judgement on their lifestyles. Through these communication strategies, mapmyclimate aims to place the global in the local and vice versa in an attempt to situate the individual at the heart of the climate problematic. The site acts simultaneously as a magnifying glass and a reducing lens on the individual, as the user's take-home impression is that she is too small to matter.

Most of our participants found themselves in the far-red end of the climate barometer after having entered their combined lifestyle choices. Mapmyclimate does not present a simple way out, a way down the colour scale, as it is the user's combined consumption

choices (including electricity, heating, transportation, purchases of non-food goods and dietary choices), which places them in the ominous red end of the climate barometer. The website enlarges the user's climate impact, communicating the message that your lifestyle matters and that change in your lifestyle is imperative. At the same time, the site endows the user with a sense of powerlessness because it does not propose any tools to achieve the recommended changes in lifestyle.

By benchmarking the user against the climate scenarios of the international climate change institutions, the user's sense of insignificance increases. Four of the six participants on their own initiative performed an experiment, reducing their energy consumption to zero on all parameters. Even this drastic move did not erase their negative climate impact but only placed them near the EU target in the blue-greenish end of the barometer, because the website includes fields of energy consumption in its calculations that the individual cannot directly affect – typically, police, government, hospitals and other public institutions. This is by no means a transparent strategy and caused a great deal of frustration among the experiment's participants:

> Dana: Apparently, it doesn't matter what I do. I can't even get down to the EU target scenario. And that gives me the feeling that it doesn't even matter. And then I can just as well walk out the door with a guilty conscience. That annoys me… It renders me powerless.
> Interviewer: What do you think is the purpose of this website?
> Dana: Well, it wants to give me a guilty conscience so I'll do something [for the climate]. But it doesn't have that effect on me. I feel like saying 'fuck you'. Because then it's all the same to me. It doesn't matter what I do....
>
> (Dana: 23)

Mapmyclimate tries to strengthen the connection between the global climate and local life by placing the user's CO_2-intensive lifestyle on a scale of international scenarios of the future. The reaction is a sense of powerlessness: If the climate is this large-scale (if *everybody* does the same), these global (IPCC) scenarios so thoroughly based in the future (in a hundred years); and if, even if I 'erase' myself, I cannot reach a climate impact of zero, why bother? The feeling that Dana voices is not one of indifference but one of frustrated engagement, a sense that she wants to act, but cannot. Paradoxically, although at first glance mapmyclimate's main aim is to enlarge the user (by communicating: "these parts of Copenhagen will be flooded as a consequence of *your* actions"), the lasting impression is one of minimisation. The climate becomes too large to act upon, the individual too small to matter.

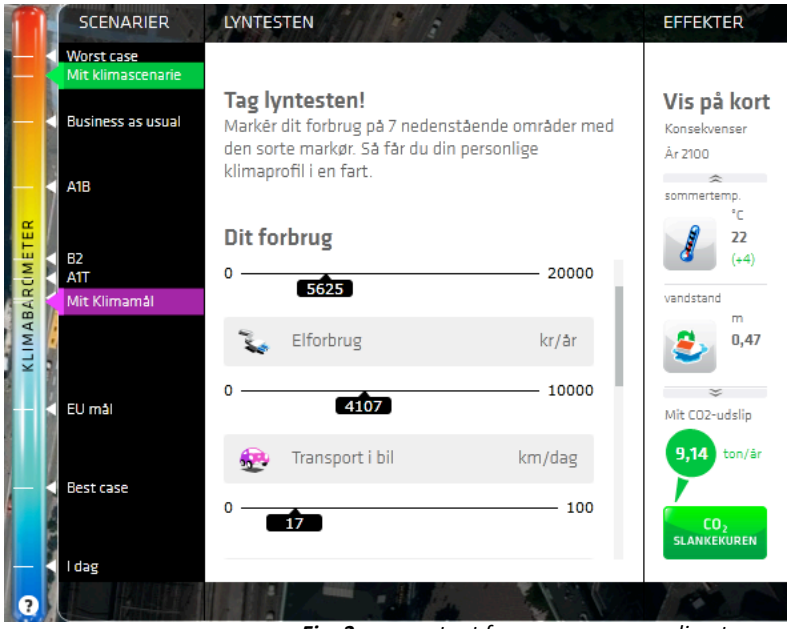

***Fig. 3**: user output from www.mapmyclimate.com*

By contrast, Klimabevidst adopts a radically different approach through its focus on making living green pay. The introductory text "*Welcome to Klimabevidst. Here you will find inspiration and guidance on how to develop a greener everyday life and save money… You can make big savings by thinking green*" is accompanied by a video showing a hand replacing an incandescent light bulb with an energy saving light bulb, introducing the 'hands-on' type of involvement with the climate that klimabevidst represents. There is no abstract information or moral imperatives, instead, easily accessible advice within a wealth of categories relating to the everyday life of the energy consumer abounds. The user's green ambitions and everyday life are everywhere co-articulated with the economic sphere. Following Marres, '*as participation is located in everyday material practice, it inevitably becomes associated with other modalities of action, such as innovation and economization*' (Marres, 2011: 514). Klimabevidst places climate engagement firmly within the considerations of everyday life, offering 'credible solutions in bite-sized chunks' (MacNaghten, 2003: 80-81, cited in Marres, 2010: 7).

When Joe visits klimabevidst, he is thrilled to see the practical guides. As the reader may recall, Joe's point of departure before being exposed to the websites was one of optimism. He was convinced that his everyday actions have an impact on the climate, and he had a clear sense of relating to the climate when buying LED light bulbs or installing energy efficient windows. Joe clicked his way through klimabevidst's guides and reacted enthusiastically whenever the website introduced him to new knowledge:

> Joe: 'Use special paint on the roof'… Okay? That's fun!
> Interviewer: Why do you find that fun?
> Joe: Because I sure hadn't heard of something like that before. So it's kind of interesting. This is new! Something like this, now I'll have it in the back of my mind when it's time to fix the roof. So that was an exciting piece of news.
>
> (Joe: 6)

Joe's sense of empowerment vis-à-vis the climate increases when using klimabevidst, as the website confirms his belief that the 'bite-sized' actions he undertakes at home directly relate to the climate. When confronted with mapmyclimate, however, Joe is overwhelmed by a sense of defeat:

> Joe: [After having performed the aforementioned experiment, reducing his energy consumption data to zero in all categories and still not reaching a CO_2 impact of zero] *WHAT!?*
> Interviewer: Did you see what happened when you changed that one?
> Joe: Yeah, it went up like crazy… Worst case scenario…
> Interviewer: So it doesn't even matter if you turn it all the way down to zero. What does that make you think?
> Joe: It makes me think that we need to come up with some really really alternative solutions if we are to really reduce CO_2. I'm actually very surprised by that. It's depressing…
>
> (Joe: 9-10)

The exposure to the websites becomes an emotional roller-coaster ride for Joe, as he shuttles between the extremities of empowerment and powerlessness and ends up reaching the '*depressing*' conclusion that '*alternative*', somehow *bigger*, solutions are needed to handle climate change, rendering his everyday efforts too insignificant to make a difference. Again, the awareness of climate change as a global phenomenon interferes with the sense of individual agency and responsibility. When the climate becomes as big as mapmyclimate makes it, the user becomes relatively smaller, and it is this smallness that startles Joe. While mapmyclimate succeeds in communicating

the bleak realities of climate change, it leaves the user feeling insignificant and obstructs his ability to act.

Rose, too, feels momentarily empowered by klimabevidst. When stumbling on a guide advising the user to install water saving nozzles, Rose recalls how she used to place a stone in the toilet to save water when flushing. The guide conjures up something inside her, a memory of a bygone practice, as well as a renewed intention to act. When asked whether she would use the website's instructions if she were to install a nozzle, Rose replies:

> I wouldn't go back to the guide on the website. I would probably just ask my roommates, and I probably will: 'Hey, I've heard that we can buy this type of nozzle that will reduce our water consumption. Should we get one?' But we'll definitely not get one right now because we've just spent a lot of money moving into this apartment… But it makes me think about putting a stone in the toilet again so we can save money every time we flush. But no, I wouldn't look at the instructions. I think I will very quickly forget this homepage after having seen it.
>
> (Rose: 13)

A couple of weeks later, however, Rose had not forgotten klimabevidst:

> Maybe it's in the little things that we can make a difference. I definitely think klimabevidst gave me more ideas and inspiration with regard to making some actual changes in my life. I talked to my roommate and we are going to have nozzles on our faucets. Klimabevidst taught me that.
>
> (Focus group: 20-21)

Here, we see how Rose has taken klimabevidst's advice to heart; she has made a small investment and a change to her everyday life that she would not have made, had it not been for the website, and at the same time she has been reminded of her old practice of the stone in the toilet. These actions make her feel more confident about her role in relation to the changing climate.

As we have seen, the websites create a space in which the participants fluctuate between positions of empowerment and impotence. Klimabevidst empowers the users by confirming their beliefs in the importance of everyday practices and climate conscious choices and by communicating new, easily implementable knowledge. Mapmyclimate, on the other hand, constructs climate change as something untouchable and global, a phenomenon entangled in abstract scientific realities far from the user's everyday concerns. This oscillation between powerlessness and empowerment, the ease with which our participants can be swayed on the subject of their climate impact, suggests that scales can be changed or redefined in a way conducive to climate engagement.

Attachment

Gomart & Hennion (1999) introduced the concept of attachments to the STS vocabulary, denoting practices characterised by an active passion '*which allows the subject to emerge… always entangled with and generously gifted by a collective, by objects, techniques, constraints*' (220). These entanglements are characterised by *dependency* and *commitment* (Marres, 2007: 774), and it is this active commitment to sociomaterial practices that determines actors' involvement in issues and creates engagement. More specifically, when the associations connected with a treasured practice are 'endangered', active commitment is produced (Marres, 2007: 774).

As noted in the introduction to this paper, the climate's fatal flaw is that most of us do not feel attached to it, we do not feel passionately about the climate. Although (all of!) our treasured attachments

are at stake when the climate is threatened, this threat is too long-term and far removed to produce active commitment. The CO_2-intensive practice of flying, on the other hand, can be characterised as an attachment. Our participants' dependency on flying comes into clear view exactly when, in order to protect the climate, this deeply entangled practice, almost an addiction, becomes threatened. Mapmyclimate makes visible the participants' attachments to flying and paradoxically strengthens them. When the users complete the boxes in the website's air travel category, their annual CO_2 emissions soar. The website in this way communicates that flying is a practice that cannot be retained if the user is truly committed to the climate. The result: a weakening of this commitment.

When Dana, who is very committed to leading a sustainable life and claims that even if she could afford a car, she would still use her bike (Dana: 3), is asked whether she thinks about CO_2 when booking a flight, she replies: "*No. Taking the plane… No, I don't [think] about it at all."* (Dana: 3). Flying is not a practice she considers part of her commitment to the climate. This might be connected with the fact that alternatives can be difficult to find or unattractive, as Bill, who works abroad, states, voicing some frustration:

> I think there are many things that I would like to change, but my travel pattern I cannot see how I can change. And I don't want to change it. And then I also think that… Ehm, yes, why don't I do something about it? I don't know, god damnit!
>
> (Bill: 4)

Mary, expressing an active commitment to flying, states her unwillingness to change her flying practice with reference to her self-image: "*Travelling is a huge part of my instinct. So I probably wouldn't change it because of that* [the CO_2 emissions]. *But I do think about it"* (Mary: 3). Rose is on the same page, expressing that *"[flying] is a big part of me"* (Rose: 17). She introduces her sense of freedom in a globalised world and her desire to see friends in other parts of the world into the entanglements of her attachment to flying: '*…we are living in this world where we are so connected, and you have friends all over the world, so you just feel like flying to see them*' (Focus group: 9).[2]

When confronted with mapmyclimate's strong reaction to users' flying habits, Bill exclaims: "*Here it comes. Air travel: Oooh, hey, hey. Auch, auch, auch, auch, auch, auch, auch, auch, auch!"* (Bill: 15). Bill is noting the climate impact of his flights, but upon watching the illustration of the flooding of Copenhagen 'caused by his actions', he refers to the building of dikes to protect the coastal population against the water. The reference to technical solutions is one way of protecting one's attachments. Robert, on the other hand, excuses himself, which resonates with Mary, who is also concerned about her frequent flying but unwilling to change her ways:

> Robert: I have many private flights… Not that private flights pollute more than work-related flights, but if it was work-related I would at least have an excuse… Well, my excuse is that I have married a French woman so I often fly to France with my family.
> Mary: I think that's a really good excuse. Better than many other excuses…
>
> (Focus group: 6)

These discussions, which expose the participants' attachment to air travel, only strengthen their commitment to flying and create disengagement from the issue of climate change. The discussions force the participants to take sides and explicitly state that they prioritise flying over the climate. It is considerably easier to let go of one's responsibility to act towards the climate than one's attachment to a

[2] An evaluation of the Mapmyclimate website reaches the same conclusion: the users show a strong aversion against the message that, in order to reduce CO_2, they should fly less (Gram-Hanssen et al., 2010: 29-31).

concrete, highly entangled activity. Possibly feeling uneasy about advocating for an extremely CO_2-intensive practice in a project concerning climate engagement, the group moves the discussion back to the intangible character of climate-related facts:

> Robert: The mess that flying makes - that's one of the things that has been mentioned over and over again and that you are therefore very conscious about. Not that you can actually grasp the dimensions of this mess compared to all the other messy things we do.
>
> (Focus group: 9)

Here, the climate problematic is deemed too complex to be productive of a real commitment: flying might be '*messy*' – but so are all the energy-related practices that make up our lives. The participants seize upon the idea that climate change is difficult to understand and act on in an attempt to obscure the fact that they are not willing to sacrifice their flights for the climate. They reach for a fig leaf, claiming that the climate problematic is so complex that it is close to impossible to do the right thing anyway. The climate problem is so messy and complicated that – through the reference to complexity – all actions related to the issue become the same or of equal importance. Through this move towards simplification, complexity and mess become the same, and the participants can ward off the sense that they *ought* to change the way they travel.

Klimabevidst, as opposed to mapmyclimate, provides tools for making small changes to the everyday life without endangering treasured attachments, offering, as Rose puts it, an "*easy*" way out:

> Mary: That's what's so difficult about flying…
> Robert: You know it and it gives you a bad conscience. But it doesn't affect what you do.
> Rose: I think it's in the everyday life that it becomes easy. Recycling, saving water, turning off the lights… doing these little things where you don't have to compromise.
>
> (Focus group: 9)

Conclusion

The main question posed in the introduction: *Can green technologies strengthen engagement with the climate?* may be answered in different ways. One response might be, paraphrasing Marres, that to engage with such green technologies as the websites analysed here '*may be a way of articulating problems of public engagement, and perhaps indeed of "materializing" them. Attempts to take the environment into account are here visibly constrained by the material, social, technical and economic relations of inter-dependence that constitute everyday life*' (Marres, 2011: 528). Many of the dilemmas highlighted by the participants in the experiment point to these constraints and show just how troublesome taking the environment into account can be – especially when the climate conscious action cannot be reconciled with everyday practices to which many people feel attached. While changing windows or placing a stone in the toilet will not challenge '*active passions*', other injunctions related to living climate consciously certainly will, as they cut deeper into the complicated entanglements that constitute everyday life.

On a different note, the primary contribution of the websites need not be that they show us how challenging it is to take the climate into account, but rather that green technologies can function as *scaling instruments*. Just as the *globality* of a given phenomenon is a condition to be achieved, so is *locality*. Mapmyclimate builds the individual into the climate, replete with CO_2 measures, natural disasters and international organisations, making the problematic huge, complex, even messy, and most certainly global. Klimabevidst performs the opposite, making the climate all about green home improvements and investments. This type of engagement with the climate is '*easy*', as Rose puts it; it is a type of localised engagement

that gives a sense of agency to the individual. Recall Latour: '*One of the solutions is to become attentive to the* techniques *through which scale is obtained and to the instruments that make* commensurability *possible*' (Latour, 2011: 5). Klimabevidst does this: It makes the user feel that her actions are commensurate with that upon which she acts - the climate. From this it seems that it might be better to suspend the universal, scientific viewpoint of the global climate if one wants to move and affect people to achieve climate goals. The climate is certainly amenable to size - and shapeshifting. Making the climate all about personal gains ('what's in it for me?'), and thereby bringing it into the home, is one way of making the individual take '*responsibility for the anthropocene*' (Latour, 2011: 7) through her actions.

This feat will not be easy. With climate change, the local and the global - these classic modernist categories - become entangled and destabilised. The possibility of holding on to any of these positions becomes nearly impossible, as mirrored in the collapsing dichotomies of near/far and empowered/powerless. While Joe, using klimabevidst, feels enthusiastic about buying LED light bulbs, mapmyclimate challenges his personal agency, and leaves him feeling powerless. The participants are torn between positions, they cannot find rest, feeling simultaneously empowered and powerless. Both positions are positions of affectedness and engagement. When Bill, discussing his frequent flying, exclaims, '*Ehm yes, why don't I do something about it? I don't know, god damnit!',* he is expressing frustration, but not indifference. It seems that, from this, taking the climate into account means that you feel compelled to act – even if you do not know how to. This oscillation between powerlessness and empowerment, the ease with which our participants can be swayed on the subject of their impact on the climate, suggests that scales can indeed be changed or redefined in a way conducive to climate engagement.

References

Barry, Andrew (2001): Political Machines: Governing a Technological Society, London: Athlone Press.

Blok, Anders (2010): 'Topologies of Climate Change: Actor-Network Theory, Relational-Scalar Analytics, and Carbon-Market Overflows', Environment and Planning D: Society and Space 2010, Vol. 28: 896-912.

Blok, Anders (2011): 'War of the Whales: Post-Sovereign Science and Agonistic Cosmopolitics in Japanese-Global Whaling Assemblages', Science, Technology and Human Values, Vol. 36(1): 55-81.

Bloor, D. (1976): *Knowledge and Social Imagery*, Chicago: University of Chicago Press.

Breddam, Mads Dupont & Astrid Pernille Jespersen (2010): 'Surfing Conversations, The Development of a Methodological Approach to the Internet as Practice', Nätverket 2010, Vol. 17: 8-16.

Candea, Matei (2011): 'Our Division of the Universe: Making a Space for the Non-Political in the Anthropology of Politics'. Current Anthropology, Vol. 52(3): 309-334.

Erichsen, Anders Christian (2010): 'MapMyClimate – Videnskab og borgerinddragelse'. Geoforum Perspektiv, Nr. 17, marts 2010.

Gomart, Emilie & Antoine Hennion (1999): 'A Sociology of Attachment: Music Amateurs, Drug Users', in Law & Hassard (eds.): *Actor Network Theory and After*, Oxford: Blackwell: pp. 220-47.

Gad, Christoffer & Casper Bruun Jensen (2010): 'On the Consequences of post-ANT", Science, Technology, & Human Values, Vol. 35: 55-80.

Gram-Hanssen, Kirsten, Toke Haunstrup Christensen, Christian Deichmann Haagerup & Susanne Hjortholt Simonsen (2010): 'Kommunikation om klima – Evaluering af "Det klimavenlige Danmark"', SBi 2010: Vol. 11.

Hobson, Kersty (2006): 'Bins, Bulbs, and Shower Timers: 'On the "Techno-Ethics" of Sustainable Living', Ethics, Place and Environment, Vol.9(3): 317-336.

Jasanoff, Sheila (2010): 'A New Climate for Society', Theory, Culture & Society 2010, Vol. 27:233.

Latour, Bruno (1999): 'On Recalling ANT', in Law & Hassard (eds.): *Actor Network Theory and After*, Oxford: Blackwell: 15-25.

Latour, Bruno (2009): *Politics of Nature*, Cambridge: Harvard University Press.

Latour, Bruno (2005): Reassembling the Social, An Introduction to Actor-Network-Theory, Oxford: Oxford University Press.

Latour, Bruno & Michel Callon (1981): 'Unscrewing the Big Leviathan; or How Actors Macrostructure Reality, and How Sociologists Help Them Do So', in K. Knorr & A. Cicourel (eds.): '*Advances in Social Theory and Methodology'*, London: Routledge: 277-303.

Latour, Bruno (2011): 'Waiting for Gaia', lecture at the French Institute, London, November 2011: http://www.bruno-latour.fr/sites/default/files/124-GAIA-LONDON-SPEAP_0.pdf

Marres, Noortje (2007): 'The Issues Deserve More Credit: Pragmatist Contributions to the Study of Public Involvement in Controversy', Social Studies of Science, Vol.37: 759.

Marres, Noortje (2008): 'The Making of Climate Publics: Eco-homes as Material Devices of Publicity', Distinktion, Scandinavian Journal of Social Theory, Vol. 16: 27-45.

Marres, Noortje (2009): 'Testing Powers of Engagement: Green Living Experiments, the Ontological Turn and the Undoability of Involvement', European Journal of Social Theory, Vol. 12:117.

Marres, Noortje (2010): 'Frontstaging Nonhumans: Publicity as a Constraint on the Political Activity of Things', in Braun & Whatmore (eds.): *Political Matter: Technoscience, Democracy, and Public Life*, Minneapolis: University of Minnesota Press.

Marres, Noortje (2011): 'The Costs of Public Involvement: Everyday Devices of Carbon Accounting and the Materialization of Participation', Economy and Society, Vol. 40(4): 510-533.

Marres, Noortje (2013): 'Why Political Ontology Must Be Experimentalized: On Eco-Show Homes as Devices of Participation', Social Studies of Science, Vol.43(3): 417-43.

Michael, Mike & Nik Brown (2005): 'Scientific Citizenships: Self-Representations of Xenotransplantation's Publics', Science and Culture, Vol. 14(1): 39-57.

Star, Susan Leigh & James Griesemer (1989): 'Institutional Ecology, "Translations" and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39', Social Studies of Science, Vol. 19(3): 387-420.

Star, Susan Leigh (2010): 'This is not a Boundary Object: Reflections on the Origin of a Concept', Science Technology Human Values, Vol. 35:601.

Biographical note

Irina Papazu and Christian Elling Scheele, Department of Political Science, University of Copenhagen.