13
The Role of New Media in Engaging the Public with Climate Change

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1. Introduction

'New media' are defined in this chapter as media which are integrated, interactive and use digital code (as van Dijk, 2006). Defined as such, new media have been touted as 'one of the greatest tools in achieving a true democracy' (Dawson; cited in Head, 2009). Malone and Klein (2007, p26) go some way to showing a potential shape of this democracy, in their web-based forum thought experiment the 'Climate Collaboratorium', describing it as 'a kind of Wikipedia for controversial topics, a Sims game for the future of the planet, and an electronic democracy on steroids'. Yet others have called for a more critical reading of the use of new media in facilitating democracy (Sunstein, 2007), with Dietz and Stern (2008) stating that there is still some way to go in understanding the dynamics of new media engagement. With these conflicting positions in mind, this chapter reviews and critically evaluates the current role, and potential future roles, new media could play in engaging the public with climate change. This chapter also contains a more detailed examination of two climate engagement approaches (one a community-based emissions-reduction programme, the other a climate contrarian engagement approach) that have successfully utilized new media to engage audiences with climate change.

2. Discovering new media

The innovations of new media come out of a rich history of mass media (see Starr, 2004; Briggs and Burke, 2006, for more). Most broadly, mass media range from entertainment to news media, spanning television, films, books, flyers, newspapers, magazines, radio and the internet. Together, these media are constituted by a diverse and dynamic set of institutions, processes and practices, that serve as mediators between communities, such as science, policy

and public citizens. Members of the communications industry and profession – publishers, editors, journalists and others – produce, interpret and communicate images, information and imaginaries for varied forms of consumption.

In the past decade, there has been a significant expansion from consumption of traditional mass media – broadcast television, newspapers, radio – into consumption of new media, such as the internet and mobile phone communications. More recent developments in new media (described in more detail below) have signalled substantive changes in how people access and interact with information, who has access, and who are the authorized definers or claims makers. Essentially, in tandem with technological advances, these communications are seen to be a fundamental shift from one-to-many (often one-way) communications to many-to-many more interactive webs of communications. Flew (2006) recognizes the advantages of new media as being malleable and adaptable in creation, storage, delivery and use; networkable; and compressible, leading to large amounts of data existing in physically small spaces. There are three key characteristics of new media: the ability to deliver individualized messages simultaneously to those with access; the control of the content shared by each individual involved; and the dependence of new media on technology (Crosbie, 2002). Hence, new media agents include interactive television and digital radio (but not analogue television or radio), mobile telephones (but not landline phones), and all internet agents such as Internet Explorer or FireFox. The development of the internet, and particularly Web 2.0, are not discussed here; suffice to say, we follow Flew (2008) in recognizing that 'social networking media' is a commonly used alternative term to Web 2.0, incorporating such principles as being decentralized, user-focused and user-led.

New media agents

One of the simplest forms of new media, and one which perhaps is closest aligned to traditional media communication, is that of the written word. Examples of written new media agents include website text (this includes online versions of traditional news media such as newspapers), SMS messaging, blogs and microblogs, and RSS (really simple syndication) feeds. Much sound-based traditional media is migrating into the digital age, with switchovers to digital audio broadcasting (DAB) radio now occurring. Listeners may now access their preferred radio stations via the internet, rather than via a traditional receiver; opening up potential global audiences to even local radio stations. As well as radio, the internet has opened up opportunities for podcasting – the recording and posting of pre-recorded sound. New media agents that use imagery also have some crossover with traditional media. However, unlike the analogue technology inherent in traditional media, new media imagery is fully digitized and interactive. So, for example, users can upload photos or videos to an online gallery, where other viewers can comment on or rate the photos – or can use satellite mapping agents to explore new landscapes. The integrated agents of new media present opportunities that could not be replicated through traditional media. Individualized

web spaces have fully integrated imagery, sound and text, with the opportunity to post real-time updates. These updates can include links to other websites, or photos and videos, linking in functionality from other social networking agents.

New media geographies

As noted above, a key feature of new media is its reliance on technology, whose availability, access and applications vary globally. Trends in mobile phone ownership and internet usage are thus briefly reviewed below.

Mobile phone access is commonplace in developed nations, with SMS ('short message service' or 'silent messaging service') text messaging used by the majority of mobile phone users; for example, of the nine in ten people using a mobile phone in Australia, 89 per cent of them will utilize SMS services (Mackay and Weidlich, 2008; Nielsen Media Research, 2008). Although there is lower mobile phone access in developing nations, the mobile phone market is growing fast, with 45 per cent of people in the developing world owning a mobile phone by 2007 (ITU, 2009). Mobile connectivity is not just important for access to SMS communications, however. Vinton Cerf, interviewed in Flew (2008), notes how 'there is no doubt that many people will first be introduced to the internet through appropriately equipped mobiles'.

It is estimated that around a quarter of the world's population, or over 1.5 billion people, are currently internet users – and this proportion is expanding rapidly (Internet World Stats, 2009; and Table 13.1 below). Growth in internet use is occurring most rapidly in Africa, the Middle East and Latin America; Asia has overtaken Europe and North America as the region with the highest percentage of internet users by region. Internet users as a percentage of population totals is currently still highest in North America, followed by Australia/Oceania and Europe. It is lowest in Asia and Africa, with under 7 per cent of the African population being internet users. It is noted that even in more developed regions, a significant proportion of the population are not internet users.

As well as between regions, there are significant socio-demographic variations in internet usage within countries. There is a general trend towards an

Table 13.1 *Internet users by region (Internet World Stats, 2009)*

Region	*Population (million; est. 2009)*	*Internet users (million; June 2009)*	*Percentage population internet users*	*Growth in internet users 2000–9*	*Internet users as % of world total*
Africa	991.0	65.9	6.7%	1360%	3.9%
Asia	3808.0	704.2	18.5%	516%	42.2%
Europe	803.9	402.4	50.1%	283%	24.2%
Middle East	202.7	48.0	23.7%	1360%	2.9%
North America	340.8	251.7	73.9%	133%	15.1%
Latin America/Caribbean	586.7	175.8	30.0%	873%	10.5%
Oceania/Australia	34.7	20.8	60.1%	173%	1.2%
Total	6767.8	1668.8			

urban–rural divide in internet accessibility; for example, major cities in Australia have a 66 per cent rate of household internet access, but this declines to 42 per cent in very remote areas (ABS, 2008). There is also evidence of a noteworthy trend in age-related access, and use, of the internet. In Australia, over 75 per cent of 15–24-year-olds have used the internet, compared to 28 per cent of 65–74-year-olds. Just 10 per cent of Australian over-75s use the internet (ABS, 2008). Recognition of the particular characteristics of different age-group cohorts is evident from terms used to describe them: from the 'Google-gen' (young people born after 1993 growing up in a world dominated by the internet; CIBER, 2008) to the 'silver surfers' (over-50s who spend much time using the internet; OED, 2009).

There is some evidence of a relationship between internet access, educational attainment and income. The Australian census found 88 per cent of individuals with a degree-level qualification or above had internet access, compared to 63 per cent of those without formal school qualifications. Income shows a greater influence; with almost nine out of ten individuals in the top income quintile having internet access, compared to slightly less than five in ten of the lowest quintile. Evidence from the USA indicates that internet use is becoming more polarized by income, with a slow diffusion of internet use in low-income groups; though this trend is not found in European countries (Martin and Robinson, 2007). Another trend – which may be echoed in indigenous communities elsewhere – is that just over one-third of Aboriginal Australians have internet access, compared to the two-thirds Australian population average (ABS, 2009).

3. New media in climate change engagement

In considering the role of new media in climate change engagement, three overlapping key themes are evident. The first is *information*. Clearly, new media present individuals with a wealth of previously inaccessible information on an endless variety of topics. But how is this information source used – and possibly abused? The second key theme is new media *interactivity*. Web 2.0 technologies give new opportunities to individuals to engage with many others, and create their own online content. Does this lead to new forms of community? Or do messages become more fragmented and increase the risk of polarization? The final theme is that of *inclusivity*. New media agents may act to enable and enhance contact and engagement between individuals, communities, organizations and others with climate change. But are individuals really interacting, and interacting more often, with more diverse audiences and information? The following sections reflect critically on each theme, as summarized in Table 13.2 below.

Information

New media present individuals with a wealth of information on an endless variety of topics. There are currently over 35 million websites containing the terms 'climate change', 'global warming' or 'greenhouse effect'.[1] Climate change information is available via new media through an array of professional

Table 13.2 *Opportunities and limitations (technological, technical and human) for climate change engagement using new media*

Theme	*Opportunities*	*Limitations*
Information	Amount of information available	Information overload
	Searchable information	Lack of search skills, ability to manipulate results from search queries
	Quality sites from key bodies	Many low-quality sites
	Personalizable information	Security risks of personalized or accessible information
	Breaking down of expert 'ivory towers'	Trust issues around information sources, role of climate contrarians[2] online
Interactivity	Many-to-many communication and content creation	Web 2.0 limited by speed to broadband users, difficulty of follow-up (e.g. behavioural impact)
	Building of new online communities, making global links	Increased fractionalization possible
Inclusivity	Potential for wide geographical and socio-economic participation	Lack of internet access and skills in poorer and older populations, and in less developed nations
	Equality of opinions and agenda setting	Many (often hidden) vested interests exist online
	Vehicle for grassroots activism	Online-led activism can hinder cause if not viewed as professional
	Fewer resources needed to engage audiences	To engage effectively often still requires significant buy-in and resources
	Anonymous nature allows participation from diverse audiences, as different 'characters' (business leader, citizen, mother)	Problems of anonymity on web forums and in blogs (e.g. lack of 'netiquette')
	Decrease distance between experts/ policy makers, science and the public	Can inadvertently increase distance through growth of contrarianism, lack of trust or 'cringe factor'[3]

bodies, such as government (see, for example, the UK's Department of Energy and Climate Change; DECC, 2009); businesses (see retailer Marks & Spencer, 2009); NGOs (see Friends of the Earth, 2009); and even scientists themselves (see the IPCC reports online; IPCC, 2009, and the Real Climate website; Real Climate, 2010). Gavin (forthcoming) suggests that individuals searching the web for information on climate change are often prompted to do so by an item in the conventional news media. However, it is precisely this availability of information that presents one of new media's biggest challenges – individuals can be inundated and overloaded with information. How does one find useful and high-quality information?

Individuals use search facilities through agents like Google and Yahoo to navigate through this sea of information, and gain access to the information

they require. Yet searching new media requires particular skills. A 2008 CIBER report investigated the information-seeking behaviour of the researchers of the future. Although CIBER were particularly interested in the behaviour of younger new media users, their results are of interest more widely to a discussion around information searching in new media. Their report reveals that although there is an intuitive assumption that users are expert searchers, it is dangerous to assume that digital literacy and information literacy go hand in hand. CIBER also report that the speed of web searching means little time is spent in evaluating information for relevance, accuracy or authority. Although data do not exist regarding climate change search activities specifically, it may then follow that individuals searching for climate information are also not actively evaluating the source of the information they come across.

A range of professional bodies provide climate information and engagement tools online. This wide range of bodies can cater to different audiences with tailored, meaningful climate engagement information. The growth of new media has provided ways for established institutions, as well as grassroots organizations, to engage individuals in more personally meaningful ways. For example, the National Museum of Australia has a Flickr site (National Museum of Australia, 2009) inviting individuals to post their own interpretations of the cultural dimensions of climate change: 'Share with us your photos that record how climate change is changing your place. Tell us how you feel about the ecological changes that you are witnessing. Are these changes affecting how you think about people and our place in the world?' The Facebook application ('app') 'Global Warming's Six Americas' (Maibach, 2009) is a further example of how individuals can receive more personally relevant information. This app guides the user through a number of questions designed to determine which one of six climate attitude segments they fall into, and suggests behavioural changes based on their attitude type. Before the app can be accessed, users must allow it access information including their name, profile picture, gender, networks, user IDs, list of friends, and any other information they share with everyone. Whilst such approaches provide opportunities for engaging large audiences with tailored information, the use of tools which require access to personal information in order to work does represent a potential security risk (Flew, 2008).

There is a wealth of climate information and engagement approaches that utilize new media, including contrarian approaches. Lockwood (2008) maintains that new media are important players in the spread of what he calls 'sceptical climate discourses' (and what we call here 'contrarian discourses'; see also footnote 2). First, he finds that these discourses in new media have been used to support more mainstream reporting of climate contrarian viewpoints. Lockwood provides an example of the UK's mainstream television Channel Four using comments from a supportive online message to shore up against criticism directed at them for the screening of the contrarian documentary *Great Global Warming Swindle*. Second, Lockwood considers that new media contribute to the volume of contrarian climate discourses. He points to evidence including that of the growth in popularity of the contrarian blog, with

four of the 20 most popular science blogs written by climate contrarians. Third, Lockwood finds new media have a significant impact on the climate discourse, citing, amongst other evidence, the impact of contrarian blogger Steve McIntyre in influencing the US Congressional Committee to examine the IPCC's hockey stick graph. Perhaps then, even more than with traditional media and communications vehicles, evaluating information (and knowing who and what to trust) is a key issue in climate engagement through new media. As Sunstein (2007, p143) comments: 'those who consult blogs will learn a great deal. But they will have a tough time separating falsehoods from facts,'

3.2. Interactivity

Much has been made of new media's many-to-many form of communication. Web 2.0 technologies, especially in individualized web spaces, create opportunities for people to receive, engage and create their own content. An example of this is the online encyclopaedia Wikipedia. The entry for 'global warming' has been edited by thousands of individuals, and has over 130 linked references.[4] New media utilize a web-like, rather than a linear, communication process. Consider, for example, the Facebook app 'Global Warming's Six Americas' (Maibach, 2009) again, which simultaneously engages multiple audiences. The app announces the individual's attitude type once they have completed a short survey, and encourages the viewer to take a number of predetermined behavioural actions specific to the attitude group. Importantly then, the user is then encouraged to send a link to the app to up to 24 of their friends, reporting both which group they fall into and encouraging their friend also to take part. A limitation to these Web 2.0 technologies is that they are restricted to users with fast internet connections, which limits their accessibility amongst some users (see Table 13.2). A further problem with these engagement processes is the lack of follow-up, or lack of commitment to behavioural actions. Without a supportive community to remind, reiterate and reinforce lower emissions choices, new media mitigation engagement approaches may be unlikely to engage individuals more than superficially.

New media offer opportunities for people to get involved in building new communities and making global linkages. Grassroots organization Camp for Climate Action UK volunteers have effectively used new media to take direct action in central London, at power stations and at airports, to emphasize their messages of education, direct action, sustainable living and building a climate action movement of a self-stated 'pretty diverse bunch' of people (Camp for Climate Action, 2009). Their 2007 Heathrow Climate Camp attracted over 2000 campers within a few hundred metres of the airport. Climate Camp use their website to inform protestors of the general location of planned action. SMS and microblogging agent twitter are vital conduits of information to inform people of the specific location in a last-minute 'swoop' – used as a way to mitigate the group's concerns about policing.[5] The Camp has now attracted similar movements in 16 other countries.

Whilst new networks are being brought together and maintained by new media, some authors raise concerns that new media are in fact leading to increased fractionalization, and new forms of localism. Woolgar (2002)

recognizes this in one of his five rules of virtuality. He finds that rather than overcoming identity as grounded in a sense of belief, location or experience, virtual communication is more likely to lead to an increase in their embeddedness. Hence, in climate change engagement, we should perhaps not be surprised to find that new media are generally not utilized to engage with communities situated in different cultural contexts, as they will retain attachment to their own identities (although see Chapter 9 for one example of cross-cultural online engagement); but, instead, used as an additional tool to keep individuals engaged who may already have some connection with each other (despite in some cases still having strong identities).

Sunstein (2007) discusses new media and the likelihood of increased fractionalization, and is scathing in his criticism of web 'echo chambers': virtual walls put up around web surfers to block themselves off from topics and opinions that they find unpleasant or uninteresting. He notes how mass media, through general media intermediaries, have to cater to a mass audience; and thus face the likelihood of both being exposed to new (albeit sometimes unsettling) opinions, but also to issues one might not have previously considered. With the growth of agents such as personalized news RSS feeds, blogs from favoured authors, and tools such as online retailer Amazon's 'today's recommendations for you', it is much easier to avoid general news items than with a general media intermediary such as a national newspaper. Sunstein (2007) suggests that this narrowing in online forums is unlikely to produce mixed opinion discussion of the kind that would lead to a desirable form of deliberation and learning, and is instead more likely to lead to the breeding of polarization and extremism.

Thus it is important to be aware of the potential limitations of new media through echo chambers. However, there is evidence that some approaches can help to minimize these limitations, or act within the echo chambers to increase visibility of certain types of information. For example, echo chambers can lead to some forms of information which, often originating from celebrities, assume greater visibility and appeal than they may have otherwise. Increasingly, researchers have placed a critical gaze upon how celebrities – seen as neo-millennial charismatic megafauna in climate debates – influence discourses on climate change via 'traditional' as well as 'new' media (see Boykoff et al, 2009).

Constituted by interacting and interactive media representations (Littler, 2008), celebrities have become 'intimate strangers' (Schickel, 2000), shaping our perceptions and actions on a range of issues, including climate change mitigation and adaptation. In efforts to understand and catalogue the growing role of celebrities in connection to climate change via media, Boykoff and Goodman (2009) have developed a 'taxonomy of climate celebrities'. An example of celebrity engagement through new media includes involvement by Sienna Miller with the organization Global Cool, to make green actions 'eco-chic not eco-geek'. Miller (and others such as Josh Harnett and Rosario Dawson) encourage people to do things such as recycle unwanted cell phones and send bi-monthly SMS messages to friends offering energy-saving tips. These calls for action are purported to 'help consumers in the fight against

global warming' (Global Cool, 2009). Another illustration of these interactions can be found in the MTV 'switch off' campaign, begun in 2007 (MTV, 2009). This initiative has harnessed the 'star power' of celebrities like Enrique Iglesias, Cameron Diaz, Xzibit, Good Charlotte, Kelly Rowland, Rufus Wainwright and Shaggy, to offer public service announcements (PSAs) promoting 'environmentally friendly lifestyle choices amongst youth in order to reduce the carbon emissions that contribute to climate change' (MTV Switch, 2009). The website is the hub of multi-media messaging, containing videos, a user-generated weblog, news, downloads and a carbon footprint calculator. On the website is the pronouncement: 'Everyone, no matter what age or where they live, can take action to reduce their carbon footprint. The MTV Switch PSAs seek to entertain, intrigue and inspire viewers to take on simple climate conscience acts such as unplugging mobile chargers and turning the thermostat down one degree' (MTV, 2009).

Iyengar et al (2007) offer online Deliberative Polling as a way of minimizing the echo chamber effect. Deliberative Polling presents a fairly structured engagement approach, but one that can be carried out online at far lower cost than traditional face-to-face engagement approaches, and one that can be fitted in at a convenient time for the target audience. Iyengar et al discuss an experiment, where online polling is run against face-to-face polling. Online participants were randomly assigned to groups to ensure a diversity of opinions, and led in online deliberations by a trained moderator. Iyengar et al found similar levels of deep deliberation and information uptake in both the online and face-to-face experiments, concluding that whilst the online deliberations may not have had all the qualities of the face-to-face deliberations, they had enough to prove it as a viable engagement approach and one that may ultimately be more appropriate than face-to-face methods for global scale issues like climate change (Dietz and Stern, 2008).

Inclusivity

An earlier section describes how access to new media is widening to diverse geographical and socio-economic populations, which provides new opportunities for engaging individuals with climate change. However, access to, or acceptability of, new media technologies is still more limited in poorer, rural and older populations. Around three-quarters of the world's population do not have access to the internet. As Gavin (2009) has concluded for the use of new media in political engagement with climate change, it is likely that only a small fraction of the population is currently using new media to engage with the issue. Yet, if one of the aims of climate engagement online is to encourage decarbonized lifestyles which are currently heavily dependent on fossil fuels, those currently accessing new media sources are a key audience.

Contrast the inclusive nature of new media with the gate-keeping of traditional media. Should an individual want to engage with others about climate change through a newspaper, or a television show, he or she would have to approach the editor to gain access – and would likely not be successful. New media on the other hand offer individuals a platform where there is an equality of opinions and agenda setting. These shifts have altered the dynamics of

what Carvalho (2007) has described as the 'authorized definers' of climate change (p232). If an individual wishes to create content, then there are many agents which can make that possible. There have been demonstrations of the power of new media agents to even bolster their traditional counterparts. In the UK in October 2009, an attempt was made to gag the *Guardian* newspaper through a court super-injunction, in order to prevent the newspaper from reporting a parliamentary question regarding alleged dumping of toxic waste in the Ivory Coast by mining company Trafigura. However, bloggers overran new media agent Twitter with posts on the theme, prompting the case to be dropped, and the *Guardian* and twitter bloggers to claim a victory for free speech.

Just as grassroots organizations, or committed individuals, can use new media to engage audiences with narratives that might not occur through traditional media sources, so can powerful organizations and vested interests also find forums to engage individuals. As discussed above, little time is spent in evaluating online information for relevance, accuracy or authority. Groups that have seized on these new media technologies in order to create the appearance of widespread grassroots organizing have been referred to as 'astroturf' organizations (Fifeld, 2009).

New media can be used to successfully support committed individuals and groups (e.g. grassroots activists), thus widening participation in climate engagement. In the USA, an open source, web-based organization called Step It Up (2009) organized days of action 'dedicated to stopping climate change'. New media enable Step It Up to cast a wide net and capture many interested, but widely dispersed, individuals. New media also facilitate the organization to empower local leaders and establish relationships with more mainstream media sources (Minion et al, 2008). Establishing these relationships is a key aim of some grassroots activist groups. Plane Stupid is a UK-based organization that uses high-profile stunts to gain media attention and raise the profile of aviation's role in climate change. Gavin (2009) warns though that although Plane Stupid have been relatively successful so far in gaining more mainstream media coverage from events such as storming Heathrow, there must be attempts to rein in 'hot heads' in the organization or diligent online campaigning can be undone. Gavin concludes that activist engagement with audiences through new media is not a sufficient condition for *effective* mobilization of audiences, which still depends on factors that have little to do with new media itself.

New media vehicles and agents are more inclusive, in that they allow engagement approaches to start up with few facilities and resources. The groups Climate Camp and Step It Up both emphasize how they started with low expectations, and were surprised how the campaigns grew with little or no knowledge of organizing nationwide campaigns. Both have well-maintained, professional looking websites that are easily found in online searches, however. This suggests at least some significant skills in content creation and management are required. And, again, contrarians are often well placed to provide considerable resources to engaging individuals with sceptical discourses through professional websites and increased search engine hits.

New media are inherently place-less, as their apparent forms, images, and texts are based in cyber-space rather than rooted in a geographical location. Referring to food consumption, Kloppenburg et al (1996) refer to 'a global everywhere yet nowhere ... in particular' (p34). The same holds true for new media consumption. Thus identities are only revealed if and when desired. In the case of virtual reality simulations (such as computer games or VR simulation 'Second Life'), participants can choose to act the part of a fictitious character. Both the identity-protection and role-playing aspects of new media's anonymity can make climate change engagement more inclusive, by allowing participants to engage more freely and openly. For example, events in Second Life have included a fictitious flood which prompted discussion of climate change (Green, 2007), as well as a virtual online conference on climate change run by the journal *Nature*, including live speakers from Imperial College, London and Stanford University, California (Nature Publishing Group, 2009).

This inherent anonymity does, however, also bring significant challenges, particularly in web comment forums and on blogs – although these challenges are by no means limited to climate change alone, but rather characterize wider participation within liberal democracies. Gavin (2009) reviews an article for the *Guardian* newspaper by climate writer George Monbiot, and its associated comment board. Gavin finds that the dialogue between participants on the discussion is fast-paced – indeed, sometimes Monbiot communicates directly with message posters, and then to general readers. But Gavin finds the postings generally disjointed, difficult to follow, often uninspiring, and in places descending to 'playground level' sniping – more 'rantosphere' (2009, p5) than blogosphere. With the anonymity of participants through new media, such 'netiquette'[6] problems are all too often encountered.

Whilst new media can increase the inclusivity of engagement at a grassroots level, they can also decrease the perceived distance between scientists and institutions and their audiences. New media have enabled a blurring of the traditional scientific peer-review process with the launch of *Nature* journal's online resources, including the online publication *Nature Reports Climate Change* and the associated *Climate Feedback* blog. Heffernan (2009) reports that bloggers can provide new angles on climate topics and can break news faster than traditional media. Heffernan also notes how Web 2.0 has allowed researchers to communicate their own results into the blogosphere outside the traditional peer-review system. Mooney and Kirschenbaum (2009) put a caveat on this engagement though, considering it likely that these science blogs will only reach a very small (and already engaged) proportion of the public.

New media can help provide a more personal face to large institutions. The previous UK Prime Minister Gordon Brown, for example, had a Twitter, Flickr, Youtube and Facebook profile. Brown's attempts to utilize new media through Number10.gov.uk were not wholly successful, and left some wondering who was actually posting under Brown's profile (Kiss, 2009). Unlike Gordon, his wife Sarah Brown has become one of the most popular celebrity tweeters on Twitter. This has been attributed to her genuine and personalized use of the new media agent (Beckett, 2009), utilizing it as a two-way engagement with her followers, rather than using it as a PR-managed one-way

communications tool. Indeed, IBM's organizational change consultant Karen Tipping comments that governments are afraid of losing control of engagement processes using new media, as Web 2.0 technologies are so user driven (see Head, 2009). A further issue with more traditional institutions using new media is understanding how such engagement approaches might be perceived. As Gavin (2009) states, quoting Fiecschi (2007): 'social networking should also be seen in the context of the "cringe factor"... attending the efforts of some politicians ... to engage with "the youth"' (p9).

The following case study boxes present two very different approaches, which have used new media as an opportunity to engage audiences with climate change. Each case study provides a more illustrative example of how the three interacting themes of information, interactivity and inclusivity in new media can act to engage audiences with climate change. Whilst Box 13.1 details a UK-based programme targeting emissions reductions in university residences, Box 13.2 demonstrates how climate contrarians have also successfully mobilized engagement through new media.

4. Conclusions

In thinking critically about the role of new media in climate change engagement, it is enlightening to consider the 2009 case of the illegal hacking of thousands of personal emails sent or received over the course of 13 years by

Box 13.1 *Case study: the Student Switch Off, UK*

The Student Switch Off (SSO, 2009) is a UK-based not-for-profit campaign, which aims to encourage students to consider energy-saving measures when they move into university halls of residence. The SSO is based around the principal of habit breaking during times of lifestyle change (see Chapter 1 of this volume, Verplanken, for a discussion on habits). There is generally no incentive, financial or otherwise, for students in university residences to use energy carefully (e.g. they typically pay a fixed amount for energy, which is often included in their total rent). Thus, there exist substantial opportunities to reduce energy consumption from heating, lighting, cooking and electrical appliances in university residences. The SSO is based on the assumption that becoming energy conscious at a key milestone in young peoples' lives, as they first move away from home, may set norms for energy conservation as students move into their own residences, but it is also based on the idea of spillover behaviour (see Whitmarsh and O'Neill, 2009): that taking the first steps to being energy conscious may promote decarbonization in the students' other lifestyle decisions and in the longer term.

The SSO uses new media as a source of information for students interested in the campaign. Each university hosting the SSO has a dedicated Facebook page, which students are encouraged to join to find out about energy-saving measures and how their hall of residence is doing in their attempts to reduce energy usage. The information provided is targeted to student residents living in university

residences. Students are further encouraged to take part in the campaign and, given targeted information, through the posting of light-hearted videos on YouTube and photos on Facebook, featuring both SSO members of staff and the students themselves.

The SSO considers it important that the campaign reaches beyond the usual 'green suspects' (i.e. already committed to acting sustainably). To do this, they incentivize individuals with little prior interest or knowledge in energy and climate change to become involved by making the campaign appealing and fun; with activities designed to create a sense of community, and frequent competition prize incentives such as Ben & Jerry's ice cream vouchers, free tickets to Student Union activities and organization of communal parties in order to incentivize hall residents to save energy. Picture competitions on Facebook (where students post pictures of themselves performing energy-saving actions) and the use of YouTube videos act as viral marketing techniques for the spread of energy-saving messages. The viral nature of these communications also enables messages to be transferred from peer-to-peer rather than in a top-down manner – so the messages are more likely to be trusted and acted upon.

Eco Power Rangers are students recruited via face-to-face sign-up, e-mail and Facebook to provide leadership in each university, and encourage residents to take an active role in saving energy. To become an Eco Power Ranger, students must pledge to use energy carefully, and encourage others to do the same. The students are further incentivized to become Eco Power Rangers by specific targeted prize-giving, such as the monthly photo competition on Facebook, which awards the best photo taken by the student conveying a message about energy-saving. Building a committed community of Eco Power Rangers at each university fosters social norms around energy saving. In the academic year 2008–9, the campaign recruited over 15.3 per cent of the students living in halls (total hall population of over 33,000) as Eco-Power Rangers, so the campaign had, on average, an advocate in every flat in the residences.

A key part of the campaign is the creation of a sense of competition in energy-saving between different halls of residents. Information on energy saved is therefore available on Facebook, on the SSO website, and posters are also distributed around the halls to foster a sense of inter-hall competition. The website also allows individuals to view the results in aggregate by university, fostering inter-university competition.

The results of the campaign are measured through electricity meters in the halls of residence. The SSO provides feedback to each hall of residence of the CO_2 saved per month or quarter, and also to the owners of the hall of residence (usually the university) on the amount of money saved through reduced electricity bills. In the academic year 2008–9, the SSO reduced electricity usage in residences at 11 UK universities by an average of 9.3 per cent, saved over 1300 tonnes of CO_2 and over 217,000 GBP in electricity expenditure. The campaign has expanded from one university in the pilot academic year of 2006–7 to 33 universities in 2009–10. Thus new media have played a key role in aiding the SSO engagement approach.

Box 13.2 *Case study: Americans for Prosperity, USA*

The US-based group 'Americans for Prosperity' (AFP) provides an example of aforementioned amplified presence of climate contrarianism online and in the public arena. Through internet organizing – mass emails, web announcements, Tweets, Facebook communications, YouTube clips, blog posts – the group has assembled a number of influential anti-climate legislation campaigns (Fifeld, 2009). Among them has been the 'Hot Air' tour, initiated in the summer of 2008. To date, this tour has held events in approximately 40 US cities such as Houston, Texas, Wichita, Kansas, Washington, DC and Kansas City, Missouri, with the message that global warming rhetoric is alarmist, and sought to 'expose the ballooning costs of global warming hysteria' (Lean, 2009). In particular, the 'Hot Air' campaign propagated the message that cap-and-trade legislation needed to be blocked, as it would prove detrimental for personal freedoms (such as the constraints on choice of lightbulbs and ability to fill automobile tanks with petrol). As part of this tour, AFP spokespeople also made emphatic claims about how climate legislation would lead to significant job losses, as well as tax increases for US citizens. Other activities that garnered media attention in the summer of 2008 included an AFP action where they flew a large hot-air balloon over the Tennessee home of former US Vice President Al Gore, in order to draw connections between high costs and heavy taxation with climate solutions that Gore had proposed. The summer 2008 tour intersected with wider politically conservative movements in the USA, such as the 'Tea Party movement' that protested taxation measures on 'Tax Day' in April 2009, and the anti-healthcare reform organizations that have protested public funding for healthcare in 2009 in various rallies and town hall meetings across the country.

AFP organizers have repeatedly touted the organization to be a 'grassroots group' (Fifeld, 2009). While current manifestations of AFP activities can be argued as such, the 'roots' of the organization tell a much different story of 'astroturf campaigning', where carbon-based industry interests lurk behind the community-based facade (Fifeld, 2009). The group is registered as a non-profit organization, and a conservative think tank based in Washington, DC. Media Transparency (2009) has documented that AFP receives ongoing funding from conservative foundations such as the Koch Family Foundation. The Koch Family Foundation and its connected organizations have demonstrated a penchant for ideological conservatism, and have provided funding for the creation of a number of other conservative organizations, including the Cato Institute and Freedomworks. This Family Foundation has generated funds from the success of Koch Industries, which is the largest privately owned energy company in the USA. At present, Koch Industries generates energy from fossil fuels and has a large stake in oil refining processes (Fifeld, 2009).

Overall, these activities in recent years have represented new engagements and new means (through new media) to voice their concerns in a political milieu where the US President and Congress had moved from Republican to Democrat control. Many conservatives have expressed concern that the President and those controlling US Congress no longer espouse values and priorities such as small

governments, free market economics, anti-climate legislation and anti-taxation. As one response to this perception of de-institutionalized voices, AFP encouraged citizens to challenge elected officials that support multi-scale climate legislation like the Waxman–Markey and Kerry–Boxer bills working their way through the US Congress in 2009 and 2010. In 2009, AFP also began a web-based campaign called 'No Climate Tax', where constituents can send emails to their elected officials to encourage them to send a 'No Climate Tax Pledge'. In addition, AFP hosts ongoing web-based campaigns called 'Stop the Power Grab', to contest US Environmental Protection Agency actions to regulate CO_2 emissions without the explicit support of US Congress.

Whilst the success of these activities and influences remains difficult to quantify, what is clear is that carbon-based industry interests have recognized the power of new media to communicate and propagate their views. By harnessing new media in these ways, particular interests have garnered the attention of policy actors and public citizens, as well as other journalists and bloggers who have covered their ongoing movements. Furthermore, US Congressional activity in the arena of climate mitigation remains highly contentious and far from resolved at present.

climate scientists at the Climatic Research Unit, University of East Anglia, UK. The emails were widely disseminated on the internet just before the UN Climate Change Conference at Copenhagen in December 2009, prompting widespread (both traditional and new) media coverage debating climate change science. Not only was the posting of the emails facilitated through new media, the affair gained traction through the posting of a searchable cache of emails online, and through the many blogs and new media news sources covering the story. Just a few weeks after the controversy broke, over four million websites made some mention of the 'CRU emails'.[7]

This exemplifies how actors and agents are increasingly turning to new media to contribute to the framings of climate change. Yet, it is important to consider the traction of new media in context. As Rosati (2007, p10) states: 'media do not produce society … media are not just object or "things in themselves" but processes whose significance is composed dialectically within the dominant social relations that make them necessary'. Thus, only within particular contexts can new media discourses be 'read' and understood. At the time of writing, it remains to be seen what impact the publication of these emails might have on climate policy and on public engagement with climate change more generally. This episode exemplifies the struggles between actors and agents within the climate change discourse, within which media (especially, in this case new media) representations are part of the expanding circulating frameworks for understanding the world. The different discourses – which range from climate change as fraud to climate science as vilified (and many others besides) – represent struggles of social beliefs and meanings. It has led Hulme and Ravetz (2009) to conclude that the pervasiveness of new

media in many people's social exchanges, and the inherent cultural lens through which we view climate change, demands changes in the very way science is conducted and citizens are engaged.

This chapter has highlighted that there is no one role for new media in climate change engagement. Instead, new media actors and agents play multiple roles – providing information, facilitating engagement, widening participation. Equally, new media actors can provide 'dis-information', increase fragmentation or not reach beyond already-engaged audiences. Approaches to engage audiences through new media are only just beginning to be explored. Important questions remain around new media and climate change engagement; such as exploring who is currently engaged (e.g. Allen (2008) suggests blogging on climate change is overwhelmingly an Anglo–Saxon dominated activity), and who may be engaged in the future. Indeed, do demographic or cultural dominances act to disengage some audiences? What is clear is that critical, and empirical, evaluations of new media in climate change engagement are needed – an appreciation of both the opportunities and limitations of new media in climate adaptation and mitigation.

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Notes

1 Calculated using a Google.com search, 8 December 2009.

2 This characterization of 'contrarians' does not include diverse 'sceptical' individuals or organizations – be they those, for example, who are still unconvinced by the science, suspicious of political manoeuvring on climate, or unconvinced by proposed solutions. Rather, we build on McCright's definition of 'contrarians', as those who 'publicly challenge what they perceive as the false consensus of "mainstream" climate science – the reality of anthropogenic climate change. They proclaim their strong and vocal dissent from this growing consensus by criticizing mainstream climate science in general and pre-eminent climate scientists more specifically, often with considerable financial support from American fossil fuels industry organizations and conservative think tanks' (2007, pp200–201). Our treatment here expands on McCright's connections between claims-making and funding, in that we also account for ideological motives behind criticizing and dismissing aspects of climate change science.

3 'Cringe factor' here refers to an involuntary inward shiver of embarrassment, awkwardness or disgust, and hence feeling extremely embarrassed or uncomfortable (OED online, 2009).

4 See www.en.wikipedia.org/w/index.php?title=Global_warming&action=history, accessed 16 December 2009.

5 These concerns are listed in an open letter to the London Metropolitan Police at, http://www.climatecamp.org.uk/blog/2009/08/20/open-letter-to-the-met, accessed 26 November 2009.

6 'Netiquette' refers to 'an informal code of practice regulating the behaviour of internet users when using e-mail, bulletin boards' (OED Online, 2009). Netiquette, when blogging, may include such actions as avoiding off-topic posting to facilitate comment reading and avoiding personal character attacks.
7 Performed using a Google.com search, 8 December 2009.

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