

Sublime technology and object of fear: offshore wind scientists assessing publics¹

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Abstract. *The development of offshore wind energy is often connected to expectations that the public will be positive or at least indifferent to the technology. Because turbines are placed at sea – out of sight, out of mind – they are expected to avoid public resistance experienced onshore. This paper examines offshore wind scientists’ constructions of the public(s) by identifying narratives in the research communities. It is based on 26 semi-structured interviews with scientists at two national research centres on offshore wind energy and technology in Norway. It finds that, although the dominant narrative of these scientists conveys a positive public, expectations of public resistance and constructions of public sentiment as NIMBY (‘not in my backyard’) are present in the research environments. This continued presence of narratives of irrational public resistance in the scientists’ imaginings could be understood as act of othering the public with the possible implication of a disembodied technology development. The paper concludes by asking whether the persistence of constructions of resistant publics mirrors a pessimistic engineering mindset.*

Keywords: offshore wind energy, imagined publics, Norway, NIMBY

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*“This is a historic day. Offshore wind energy may become the next adventure for the Norwegian industry and energy sector”.*²

With these enthusiastic words, Norway’s former Minister of Petroleum and Energy, Terje Riis-Johansen, introduced a new act on offshore renewable energy in the summer of 2009. A public debate followed this optimistic political rhetoric. It was dominated by supporting views of offshore wind energy (author, forthcoming). Particularly its economic benefits were highlighted. Industrial actors emphasised the potential for Norwegian industry to become a leading actor within the supply industry in a growing international offshore wind market. In addition, the optimistic rhetoric included expectation of a positive public. Since turbines were to be placed far out at sea and thus would be ‘out of sight, out of mind’, problems with public resistance would be avoided. Hence, in many contexts, offshore wind technology was portrayed with enthusiasm and fascination. It could, accordingly, be described as a technological sublime (see Nye, 1994).

Against this backdrop, in 2009, two national research centres on offshore wind energy, NOWITECH³ and NORCOWE⁴, were established with the aim of becoming international leaders in developing technological designs mainly for deep water. Thus, a fairly large number of scientists were engaged in the development of a technology, which supposedly would be received positively by the public. Were these scientists similarly optimistic concerning public sentiment towards offshore wind technology? By identifying and examining narratives found in interviews with scientists associated with the two national research centers, this paper analyses these scientists’ constructions of the public(s).

² Press release 82/09, Ministry of Petroleum and Energy, 26.06.2009

³ Norwegian Research Centre for Offshore Wind Technology

⁴ Norwegian Centre for Offshore Wind Energy

Noticeably, the tailwind, in which the two research centers were founded, soon turned into a slight headwind when in March 2011 the new Minister of Petroleum and Energy, Ola Borten Moe, declared that: “There is no point in spending many tax billions to build a wind farm offshore only because it has to be offshore”.⁵ In other words, developing offshore wind energy in Norway was argued to be too expensive. The research centers responded by emphasizing their focus on developing cost-effective solutions for offshore wind energy. Still, the high initial investment costs make offshore wind energy dependent on political support.

Thus, the current situation of offshore wind energy after 2011 appears ambiguous and uncertain. On the one hand, Norway focuses on research and development of offshore wind technology, an implementation of which promises industrial development. On the other hand, industry representatives complain of a lack of necessary political support (Hansen and Steen, 2011), which is demonstrated by the fact that no commercial offshore wind farm has been built yet.

This ambiguity related to developing offshore wind energy in Norway needs to be understood in the context of the country’s particular energy situation, which is characterized by two distinctive features. First, nearly all electricity production comes from inexpensive and sustainable hydropower representing a gold standard against which new energy production is measured (Sørensen, 2007). Second, Norway has a large offshore oil and gas industry, which is of significant economic importance to the country. The oil and gas industry is competing with offshore wind in terms of resources and manpower, while at the same time holding expertise that readily may be transferred to offshore wind energy. Besides, although produced far at sea and “out of sight”, Norwegian oil is very present in public debate.

⁵ Stavanger Aftenblad 17.03.2011 (my translation)

In addition to this particular energy situation, Norway has a history of controversy about energy infrastructure developments, such as hydropower, onshore wind energy or recently, the power lines in the Hardanger region of Norway, which also may play into the scientists' imagined offshore wind public(s). These controversies stand out due to the prominent role attributed to nature conceptualized as pristine and in need of protection from human intervention (Bye and Solli, 2007).

Earlier research on scientists' imagined publics has mainly focused on emerging fields such as nanotechnology and biotechnology. A very common finding is that scientists imagine publics as ignorant and inadequately informed about science and technology (Besley and Nisbet, 2013; Blok et al, 2008; Michael and Birke, 1994; Powell et al, 2011). Furthermore, publics are frequently 'othered' by constructing their concerns as irrational and emotional in opposition to factual, rational and objective science. For example, in his study about the function of the discourse of scientists working in the controversial field of crop genetics, Burchell (2007) finds that scientists constructed the public as contingent 'others'. Their 'beliefs and actions are seen to derive from personal shortcomings, inclinations and self interest', in contrast to the rational empiricist selves of the scientists (Burchell, 2007, p. 145).

In the context of renewable energy, Walker et al (2010) find that industry and policy development actors expected that 'the materialisation both of negative responses and of active opposition is a "real and present danger" for RET [renewable energy technologies] development' (Walker et al, 2010, p. 937). Fears of public hostility are often related to the NIMBY ('not in my backyard') concept as a narrative of irrational public resistance. A potentially hostile public is linked to specific developments in specific localities, and contrasted with a generally supportive public. Generalisations of the public are made to present it as positive towards renewable energy technologies, while accounts of hostile, opposing publics are more differentiated (Walker et al, 2010). Moreover, Cass and Walker (2009, p. 65) find that

their interviewees described opponents' responses as 'abnormal, involving passion, anger and "strong feelings"', while support was construed as normal. The expectation of a negative public attitude and hostility towards technological development is found particularly prevalent related to wind energy (Walker et al, 2010).

This paper deals with academic scientists, who arguably have different experiences with publics than the industry and policy actors referred to above, since they, for example, do not directly take part in planning and licensing processes where public hearings are obligatory in Norway (Gjerald, 2012). Hence, it is interesting to learn how academic offshore wind scientists navigate between expectations of public negativity towards wind energy in general, and the promises of offshore wind energy to be a technology, which they supposedly are free to develop without consideration of public resistance. What standing do the NIMBY narrative and other stories of public resistance (which should have been resolved by moving the wind turbines offshore) have in the scientists' constructions of public(s)? In the following section, I introduce the theoretical considerations guiding my analysis of offshore wind scientists' imagined publics.

Imagined publics

This paper draws upon two concepts – 'imagined lay persons' (ILP), as introduced by Maranta et al (2003), and NIMBY ('not in my backyard') – within the broader theoretical approach of Public Engagement with Science and Technology (PEST). Walker et al (2011) propose a framework for understanding public engagement related to renewable energy technologies (RET). This framework has four characteristics: (1) it is symmetrical, investigating both public engagement with the respective technologies as well as RET actors' engagement with publics; (2) it focuses on expectations and anticipations that influence the engagement of both publics

and RET actors; (3) it is dynamic in acknowledging development and changes in expectations and engagement over time; and (4) it recognises the contexts in which these interactions take place, such as policy, regulation, place and history. In this paper, I draw upon the notion of symmetry by redirecting focus from the frequently analysed public engagement with science to scientists' engagement with publics. I also focus on anticipations and expectations by investigating the scientists' imagined publics while at the same time acknowledging their dynamics and situatedness.

The concept of 'imagined lay persons' (ILP) was introduced by Maranta et al (2003). The authors observe that face-to-face dialogue or interaction between experts and lay people is often absent. Nonetheless, experts form imaginings or constructions of lay people, often implicitly, which are integrated into their work, especially in the context of application. Woolgar (1991), for example, shows how the design and production of new microcomputers could be understood as a configuration of future users. This includes not only a construction of the identity of the users, but also definitions and constraints of the users' future actions. Using the metaphors of 'machine as text' and 'user as reader', Woolgar (1991, p. 69) claims that 'the text might be said to be designed (perhaps implicitly, perhaps unconsciously, but always within a context of conventional resources and expectations) for the reader'.

The imagined lay persons are functional constructions that experts need to shape technical solutions that are to be used by lay people or, as Maranta et al (2003, p. 151) put it, 'conceptions of lay persons as they are manifested in the products and actions of the experts'. Thus, experts do not only deal with technical solutions and organisational procedures, but they are also 'lay person makers' (Maranta et al, 2003, p. 152). Their imaginings of the public become actors with agency that potentially may be performative and influence the development and implementation of technology, decision-making processes and future interactions with publics.

Thus, the imagined public might have greater long-term influence than the 'real' public (Walker et al, 2010).

Scientists, policymakers or industry stakeholders may imagine the public in many different roles. Earlier studies find the public construed as a customer, a consumer, a neighbour, a citizen, a 'man on the street' or a fuzzy generalised public collectivity (Besley and Nisbet, 2013; Burningham et al, 2007; Cotton and Devine-Wright, 2012). Michael (2009) differentiates between PiPs (publics in particular) and the PiG (public in general). PiPs are stakeholders with a particular interest in a scientific or technological issue, while the PiG is the generalised public collective. Similarly, Maranta et al (2003) differentiate imagined lay persons according to how experts assemble them as addressees of their engagement activities. While individualised ILPs are addressed as individuals (e.g. through science centers), representative ILPs are expected to represent a specific part of society (e.g. as participants in experiments such as consensus conferences). The generalised ILPs are addressed as a collective, similar to the PiG. In order to account for all lay persons in the collective, it must be thought of in very general terms. Thus, generalised ILPs 'are more pure results of the concepts and theories that the lay person makers hold than with other ILPs' (Maranta et al, 2003, p. 160).

Walker et al (2010) propose to include the idea of the public as ungraspable and slippery phantom (Latour, 2005; Lippmann, 1993 [1927]), or, as Latour (2005, p. 38) puts it, 'this fragile and provisional concept', in the attempt to understand imagined publics and to analyse how the phantom public becomes imagined and is made real and influential. In addition, Walker et al (2010) comment on the democratic implications of analysing imagined publics. Since literature on public engagement mainly deals with formal or staged engagement events, the incorporation of imagined publics can be seen as a virtual form of public participation. Thus, learning about scientists' imaginings of the public may not only help us to understand technology design,

implementation and public engagement activities, but also give the public a voice, although partial and generalising.

According to Maranta et al (2003, p. 154), the deficit model of the imagined lay person (i.e., ‘the ignorant lay person who is curious and eager to know all about science’) is the standard. However, Irwin (2006) argues that this knowledge deficit model increasingly competes with a trust deficit model; in addition to public ignorance, public mistrust of science is constructed as problem. This is articulated in science policy, for example on the European level, where a rebuilding of trust in science is mentioned as an important motive for public engagement (European Commission, 2002). Also the recent Norwegian science policy white paper describes trust in science as cornerstone for knowledge-based decision-making in a functioning democracy (St.meld.nr.18, 2012-2013). At the same time, though, the importance of scientific knowledge to the public is emphasized. Hence, Norwegian scientists are requested to communicate their research to a wider public in order to increase both public knowledge and trust in science.

Scientists’ imagined publics are culturally and institutionally embedded. Constructions of publics are implicated in the contexts in which scientists operate. However, Wynne (1995, p. 364) argues that although scientific cultures differ, there are ‘fundamentally similar issues of the legitimation of science not only as instrumental knowledge but as a corresponding universalist culture’. He claims that deficit models of publics are functions of a ‘culture of scientism’ (Wynne, 2006, p. 214). Similarly, Irwin (1995) refers to a science-centered worldview, within which publics are constructed as ignorant and irrational. This worldview ‘does provide a powerful and frequently reiterated case for the centrality of scientific reasoning to social development’ (Irwin, 1995, p. 14).

Accordingly, Wynne (2006, p. 219) argues that ‘scientific knowledge unwittingly performs its imagined publics in normative ways’. He holds a scientific culture, which lacks self-reflection, presents scientific knowledge as universal and certain, and continues to reproduce entrenched modes of thinking such as the deficit model, responsible for existing public alienation and mistrust of science. Uncertainties and contingencies are removed from this official representation of science (Delamont and Atkinson, 2001). Further, Wynne (1995) emphasizes a culture of control as characteristic of science. In this dominant scientific culture, legitimate public concern is reduced to questions of scientifically measurable risks while other concerns or alternative perceptions of risk are dismissed as irrational or ignorant (Gregory and Miller, 1998; Irwin, 2006; Wynne, 2006). As we have seen, earlier studies find that constructions of publics as irrational are often contrasted to rational science. Hence, we can argue that imagining publics involves boundary work (Gieryn, 1983). Constructions of the ‘other’ (publics) are also constructions of the self (scientists).

As noted, renewable energy technology experts commonly imagine the public to be resistant. Bauer (1995, p. 13) argues that, in an engineering context, resistance to technology traditionally is considered ‘deviation from the Rational writ large’. Engineers claim rationality. Thus, resistance to their technologies is seen as irrational. Furthermore, Bauer points out that resistance often is directed towards new technologies, emphasising that “‘newness’ makes a difference’ (Bauer, 1995, p. 20). This could be linked to the concept of ‘resistance to change’, which, according to Dent and Goldberg (1999), exists as a mental construct and largely unquestioned truth in organisational life. Also in this context, resistance is portrayed as irrational and deviant (Ford et al, 2008).

The NIMBY (not in my backyard) concept exemplifies the portrayal of such irrational resistance. It refers to public resistance against the building of different infrastructure developments, claiming that people generally are supportive of such developments, but for

selfish reasons become hostile when they are built close to their homes. It is important to note that the NIMBY concept mainly is used pejoratively, as it alleges that people are irrational with double moral standards. Wolsink (2012, p. 86) claims that ‘accusing someone of NIMBY-ism is a direct insult’. Commonly, NIMBY is employed to explain the gap between high general support and strong local opposition. It has been widely used in the context of opposition towards renewable energy projects, particularly wind energy.

During the last decade, the use of the NIMBY concept to explain public opposition has been strongly criticised (see e.g. Aitken, 2010; Devine-Wright, 2009). It has been highlighted that the concept contains negative assumptions about the public, including ‘an unproblematic agreement that various developments are required, but that for selfish, irrational, and parochial reasons people are willfully and ignorantly preventing the siting of necessary development in the local vicinity’ (Haggett, 2011, p. 504).

Additionally, it has been shown that the main assumptions underlying the NIMBY concept – the proximity hypothesis (i.e. that people are more negative when developments are closer to their homes) and the decreasing property value hypothesis (i.e. that development is opposed primarily because residents fear a devaluation of their property) – cannot be generally confirmed (Wolsink, 2012). Actually, many studies indicate that people living close to the respective sites have the same or even more positive attitudes than people living farther away (Jones and Eiser, 2010; Ladenburg, 2008; Warren et al, 2005).

To summarise, it has repeatedly been claimed that the use of the NIMBY concept to explain public opposition is misleading and inappropriate (Burningham et al, 2006; Devine-Wright, 2011a). Consequently, mainstream academic thinking has abandoned NIMBY as an analytical tool (Devine-Wright, 2011b; Wolsink, 2012). However, the concept still lingers on – partly even in academic writing (as shown by e.g., Burningham et al, 2006; Wolsink, 2012), but

mostly in the media and among planners, developers and policy-makers (Cotton and Devine-Wright, 2012; Mcclymont and O'hare, 2008). Wolsink (2012) describes NIMBY as an unquestioned 'self-evident truth' within institutionalised technocratic thinking in the field of renewable energy deployment, to see issues of social acceptance mainly in NIMBY terms.

As noted, earlier studies of imagined publics observe a presence of expectations of public resistance. Concepts of irrational resistance, for example a NIMBY public, seem to persist in many areas of society, despite criticism from social science. However, offshore wind energy could be an exceptional case where scientists are not concerned with public resistance, since the technology is 'out of sight' and thus also 'out of mind'. Hence, I expected the offshore wind scientists to construct the public either as positive or indifferent towards offshore wind energy, or the public to remain a 'phantom,' in the sense that the scientists would not consider it necessary to deal with or to care about the public at all.

Method

The paper is based on 26 semi-structured interviews conducted with offshore wind scientists associated with the two Norwegian research centers for offshore wind energy: NOWITECH and NORCOWE. 35 scientists were interviewed in four focus groups and 22 individual interviews. This represents a high proportion of the total number of offshore wind scientists in Norway. Although focus groups should have a different dynamic than individual interviews and are mainly used to provide data about disagreements, negotiation and a variety of perspectives, in this case, focus groups and individual interviews functioned quite similarly. There were no major disagreements between participants in the focus groups and the ambivalences that emerged were, for the most part, also found in the individual interviews (see the next sections for an illustration of those ambivalences). The interviews, which lasted

between 35 and 80 minutes, were transcribed and anonymised. Interviewees, of which 20 were Norwegian and 15 of other nationalities, were given pseudonyms.

Data analysis was informed by my interest in interviewees' narratives about publics. Gubrium and Holstein (1997, p. 147) refer to narrative as a 'meaning-making device [...] [which] assembles individual objects, actions, and events into a comprehensible pattern'. Narratives are used as instruments for sense-making. Moreover, narratives are constructions of the self (Andrews et al, 2002). Thus, as mentioned above, narratives of scientists' imagined publics also include constructions of their own role as scientists.

Narrative analysis allows addressing complex and ambiguous issues (Mitchell and Egudo, 2003). Hence, using narratives enabled me to highlight ambivalences in scientists' imagined publics and to show how the scientists constructed and drew upon different and contradictory discourses about publics. Furthermore, narrative analysis emphasizes the situatedness of narratives and facilitates the consideration of contexts (Coffey and Atkinson, 1996).

Riessman (2008, p. 5) writes that 'stories demand the consequential linking of events or ideas'. Thus, instead of taking single arguments out of the interviews to answer more general questions (as is done, for example, in grounded theory methods), I carried out a thematic narrative analysis by looking for series of arguments and analysing how narratives developed during the interviews, as this would also enable me to detect inconsistencies and contradictions within the narratives.

In accordance with Polkinghorne's (1995) understanding of narrative analysis as movement from elements to story, the narratives used as demonstration in this paper were synthesized from several interviews in order to include as many relevant aspects as possible. These narratives about scientists' imagined publics are, of course, co-constructions of interviewee accounts, my questions and my reactions to their accounts (Riessman, 2008).

The majority of the scientists interviewed were employed by Norwegian universities, but a few worked for other research institutions. Thus, although the association to the two research centers provided an institutional context regarding offshore wind energy, presumably the scientists' everyday working context in addition to their disciplinary contexts in a range of mostly engineering sciences, from electrical, mechanical, civil and transport engineering to physical oceanography, marine technology and meteorology, may be regarded as least as influential for the scientists' narratives of imagined publics. Furthermore, although the research centers facilitated contact to the industry, potential public engagement activities were largely left to the individual scientists. As mentioned above, in Norway scientists are increasingly expected to communicate their research to the public. However, a large majority of the interviewed scientists, both PhD candidates and senior researchers, did not engage in science communication activities related to offshore wind energy. Furthermore, it is important to note that most interviewees did not mention the public without being explicitly asked. When talking about the future of offshore wind energy or challenges connected to the development and implementation of this technology, interviewees focussed mainly on the political framework and technology development (see Walker et al, 2010 for a similar observation about their interviewees).

The interviewed scientists varied according to their position, discipline, age and nationality. Hence, we may expect also the scientists' imagined publics to vary along these parameters; for example senior researchers to construct publics differently than PhD candidates due to their supposedly greater experience within public engagement. Surprisingly, though, no noticeable differences or pattern related to these parameters were found. Hence, I do not differentiate between interviewees according to these parameters in the narratives of scientists' imagined publics, which I present in the next three sections.

Out of sight, out of mind: the narrative of the positive public

As expected, the offshore wind scientists were keen to put all worries about public resistance aside by arguing that siting wind turbines far out at sea would place them away from public concern. All interviewees agreed that there would be fewer conflicts when placing wind turbines offshore than on land. This is because they believed that the public would be positive towards the technology when they would not have to see it. Research Manager Foss pondered: ‘Offshore. So I think that people think, “Ok, get them out at sea so that I don’t have to see them, then it will be fine”. And it’s not more complicated than that, I think’.

Similarly, PhD Candidate Smith remarked that people generally are negative towards wind turbines, though if the turbines were to be placed out of sight, people would be positive. Referring to her own experiences of talking to people about her research, she explained: ‘I feel that most people have the attitude that if you say you work with wind mills, then it’s “Ugh” until you say that you work with offshore floating wind mills, then it’s “Oh yes, then we don’t have to see them, that’s nice”’. According to Smith, a realisation of wind parks in Norway is only possible far offshore.

If you want a wind park in Norway, then I think it depends on that you have a technological development which makes it possible to remove them [the wind turbines] out of our sight; that you can move them so far out that we don’t see them. But that’ll be big technological steps to take.

Both Smith and Foss constructed the public here as being mainly concerned with the visibility of wind turbines. If the turbines are out of sight, people will support their development.

Research Manager Berg also considered removing turbines from sight a solution: ‘The advantage, aesthetically, is that if you go far out at sea there is no one except for those in boats who see it. [...] Nobody sees it. So who cares?’ However, according to Berg, this will not only overcome public resistance due to visual disturbance, but also due to environmental and

biodiversity issues. He referred to the controversy about endangered seabirds, which has been important in the context of onshore wind energy in Norway (see Solli, 2010) and argued that this conflict could be avoided by moving turbines far out at sea.

When it [the bird] falls in the sea then nobody will see it. So the problem will be of the same magnitude [as on land], but it won't be in focus. [...] Seen a little cynically, you could say that it is easier with offshore wind mills. First, they are out of sight. And second, everything that possibly dies out there, nobody will see.

Hence, Berg extended the constructed public concerns to also include visible environmental issues.

However, not all interviewees construed a positive or indifferent public based solely on the assumption that offshore wind energy would prevent conflicts related to visibility and biodiversity. Professor Antonsen imagined the public to be entirely positive towards offshore wind energy mainly because it is renewable and may result in economic advantages. He also thought that the public would be interested in and fascinated by the technology itself.

I suppose people think that it sounds fun, a little exciting. Oh, imagine that you can, especially when it starts to get floating, imagine that you can manage to get it working. [...] And if you start to tell people how much energy you actually can get out of a large wind park, then I think they'll be amazed. [...] So I think people really appreciate it.

Antonsen's imagined public is amazed and excited by offshore wind technology, somewhat in the sense of the technological sublime.

To summarize, in this narrative of the positive public, the interviewed scientists constructed the public as being mainly concerned with issues of visibility. Drawing on experienced or mediated stories about conflicts mainly related to onshore wind energy, the scientists imagined offshore wind energy to generate comparatively less or no conflict. 'Out of sight, out of mind' was the defining phrase. The public, whose attitudes were reduced mainly to visibility issues, appears as a category distinct from the scientists' selves.

The narrative of the positive public was characterized by technological optimism; technological improvements were believed to solve the problem of public resistance. Offshore wind was constructed as sublime technology to be developed without having to consider public concern. However, taking into account the expectations of a hostile public identified in earlier studies, did the scientists really consider offshore wind energy an outright solution to potential problems emerging from public resistance? This optimistic narrative of the positive public was soon modified and partly contradicted when economic issues entered the interview accounts.

New jobs and high electricity prices: the narrative of economic concerns

Mirroring policy debate on offshore wind energy with its focus on costs, economic arguments were very frequently included in the scientists' conceptualisations of public sentiment. While expectations of new jobs and industrial development were seen to generate positive views, some interviewees believed that people would be negative because offshore wind energy would lead to much higher electricity prices due to its high development and implementation costs.

In this narrative of economic concerns, scientists conceptualized the public mainly as a mass of energy users. Professor Dahl mentioned users as potential opponents. 'Opponents will be the users who realise that this will get enormously expensive. [...] Everybody who sees the costs realistically will be an opponent of offshore wind in Norway'.

Dahl linked his story of the user who is unwilling to pay more for electricity to the question of whether offshore wind energy should be used to strengthen Norway's position as Europe's 'green battery'. This could be done by combining offshore wind energy and hydropower, using Norway's hydropower plants as storage facilities and selling hydropower to European countries when demand is high. However, Dahl argued that people are sceptical of this idea, again

because of expected costs. ‘Who is going to pay for this? Would you pay for this? [...] How it is now, it will be us, the users in Norway, who have to pay to get permission to be a battery’. Contrary to interviewee accounts in the narrative of the positive public, here Dahl identified with the users and constructed himself as part of the public; as ‘us, the users’.

Later, Dahl qualified his construction of an opposing public by arguing that public attitude depends on the way technology is presented. If Norway were presented as a battery for an environmentally friendly Europe, the public would probably be positive. However, if people were to find out how expensive this would be, they would be against it. ‘If you find out that this will lead to the costs for our energy increasing to one fifty,⁶ why on earth should we pay for all the others?’ In this manner, Dahl constructed the public (including himself) as potentially negative, drawing on an economic framework of cost concerns.

Some interviewees saw the economic issues differently, in particular those concerning the public attitude towards Norway as a green battery. PhD candidate Evensen argued this proposal could be seen as economically beneficial for Norway in the future. ‘When it is profitable, it will be easier to sell this argument, I think, because you create jobs in Norway [...] and you add value for Norway the same way as we do with oil today. We don’t extract oil for ourselves’.

Also other interviewees mentioned the potential for industrial development and new jobs as crucial to peoples’ attitudes. Research Manager Berg said: ‘When there would come industrial jobs out of this, people would have a whole different attitude towards this. Then it would have been lucrative’. Similarly, Research Manager Sunde stressed that:

Then the other thing comes in that it creates jobs probably also here in Norway. You will get an industry; you have some areas, which you have developed within the oil and gas industry and that you can build on further. So you can work with a prepared supply industry. It creates jobs during

⁶ 1,50 NOK ≈ 0,20 EUR per kWh. Although varying significantly depending on region and season, in 2011 (when the interviews were conducted), average price per kWh was 0,45 NOK excl. tax and grid rent and 1,02 NOK incl. tax and grid rent (SSB).

construction but also during operation. It will create jobs along the coast. [...] So I believe it will be a positive thing.

To summarize, as in media discourse and policy debate, economic concerns were prominent in scientists' imagined publics. This focus may also derive from the research centers focus on developing cost-effective technology. As scientists partly identified with the public in this narrative of economic concerns, these appear more legitimate than visibility concerns in the 'out of sight, out of mind' narrative where the public is constructed as distinct category from the scientists.

This narrative of economic concerns already points to publics also constructed as potentially resistant towards offshore wind energy. Thus, although all interviewees imagined the public to be positive or indifferent towards offshore wind energy because wind turbines would be out of sight, most interview accounts were also characterised by some ambivalence. A fear of public resistance was present in 21 of the 26 interviews. How were these fears articulated?

Making the public NIMBY: the narrative of the negative public

In addition to relating potential public resistance to the costs of offshore wind energy, most interviewees also mentioned visual disturbance and environmental consequences of wind turbines. According to Research Manager Bakke, 'if you ask people on the street, they either don't really have an opinion about it or they've a very strong opinion that it destroys the horizon, the birdlife and animal life'. People were believed to be sceptical of offshore wind because it is not *natural* to have turbines at sea.

Hence, ambivalence became evident when in most interviews the narrative of the positive public alternated with constructions of a negative public. On the one hand, issues of visibility and environmental consequences were taken to be irrelevant and the public imagined as

positive because the turbines would be out of sight. On the other hand, the same turbine was a source of fear for public resistance. Thus, as with onshore wind energy (see Bye and Solli, 2007), an ambivalent construction of people's perception of wind energy was found in the scientists' accounts. Wind power was a green renewable energy related to climate change and sustainability but also a threat to biodiversity and conservation of nature.

To strengthen their case about a sceptical public, many interviewees referred to public opposition to onshore wind energy and new power lines based both on media reporting and on their own experiences of talking to people about wind energy and stories they had heard from other people. Research Manager Bakke referred to the controversy over power lines in the Hardanger region in Norway, a tourist destination known for its beautiful fjord landscape, as a prime example of excessive public opposition to technology that invades nature and landscapes. The important role of untouched wild nature in Norwegian identity was commonly drawn upon as an explanation for public resistance. As Research Manager Sunde put it, 'it's caused by nature. I mean, nature in the Norwegian national soul'. Sunde constructed public opposition as part of Norwegianness – caused by the value of untouched nature in the Norwegian soul.

A particular Norwegianness was also drawn upon related to the country's position as energy nation. A frequent explanation for an imagined negative public attitude was that Norwegians are spoiled because of Norway's special energy situation. Since 99% of electricity production is by hydropower and already renewable, Norway does not have the same need for new renewables as other countries. As Research Manager Bakke pointed out, 'We are spoiled with cheap electricity, and we have the oil. [...]. So, all these interventions are kind of "Uhhh"'. PhD Candidate Smith argued more generally: 'Norwegian people are very spoiled. You don't want to see things. You want that it's very safe, it should be environmentally friendly. [...] You should not hear it either'. Interviewees also argued that people generally oppose new

things and are resistant to change. Researcher Arnesen added that she has the impression that people in general are tired of hearing about environmental issues.

This particular Norwegian public with negative attitudes towards offshore wind energy was often constructed in opposition to publics of other European countries (with Denmark used as the main reference). The latter publics were conceived as having a more positive attitude, partly due to a more pragmatic way of approaching the issue as opposed to Norway's more idealised approach. In one focus group, interviewees elaborated on the idea that Norwegians are negative towards the materialised wind turbine but positive towards it as an idea or symbol:

PhD Candidate Sandvik: They like it [offshore wind energy] as an idea or concept. [...] People know very little about what it implies to have an electricity supply, which to a large degree consists of wind turbines. The Danes know about that. And it is much more pragmatic than here. [...] the romance about wind turbines is very alive here.

PhD Candidate Evensen: But what they did there [in Denmark], are things which belong to the industry. It is because we don't have an industry.

PhD Candidate Sandvik: I just think that a wind turbine is put in a completely different light in Denmark, isn't it, how extremely pragmatic... And it's simply the fact that people don't know that much about it which leads to that people can idealize it in that way. [...] It has absolutely not been pragmatic in Norway so far.

PhD Candidate Riise: I just wonder whether this is why it has been so successful in Denmark. Because it's just been like all other industries. It's just something we do because we have to do it like that. Instead of having a very idealistic thinking about us saving the world.

Also the strong Norwegian regional emphasis with respect to politics was discussed as a hindrance for developing offshore wind energy. PhD Candidate Riise stated: 'It has been possible to complain about decisions so that in the end those who wanted to develop got fed up because it costs money to keep the process going. [...] The local democracy can be a hindrance. It is a little bit beyond the pale, but I actually believe that'. PhD Candidate Evensen added that people do not know their own good. Later he told a story about a local coastal community where people threatened to blow up offshore windmills if they were built. Also, PhD Candidate Smith referred to her own experienced local protest: 'If you read the local newspaper where I

come from, then what happens there is that they want to stop the development of wind mills and they want to destroy everything'. Research Manager Bakke explained:

In many ways Norway is governed by regional policy concerns. We really want to have all these regions and all outskirts, and we want to keep them as long as possible. This is a state initiative we wish to have. So, all local communities get very strong in such debates about interventions in their area. It gets very close and opinions quickly become very outspoken. Although we are very few people in this country, we manage to make big headlines about those things.

Hence, interviewees considered the particular Norwegian focus on local democracy as well as local community initiatives as potential danger for offshore wind development.

To explain people's opposition towards offshore wind energy, interviewees very frequently drew upon the NIMBY concept. In fact, of the 21 interviews, in which the public was imagined to be potentially resistant, in as many as 14 the interviewees (across academic disciplines, position, age and nationality) described the public as having a NIMBY attitude. As PhD Candidate Olsen put it: 'Basically people don't want to have it in the backyard of their area'. Research Manager Berg connected NIMBY to peoples' concern for the environment: 'It is the environmental part of this that everybody thinks that wind power is alright, but that it somehow doesn't suit here where I live'. In one focus group discussion, NIMBY was used to explain Norwegian public resistance as opposed to the widespread use of wind turbines in, for example, advertising, as a symbol of a positive future. PhD Candidate Sandvik: 'It's strange that people think it [the wind turbine] to be aesthetic, but at the same time nobody wants to have it in their neighborhood'.

Even though the NIMBY narrative is widely drawn upon by, e.g., media and policymakers to explain public opposition in other countries (Burningham et al, 2006; Devine-Wright, 2011b; Wolsink, 2012), some interviewees used the concept to construct a particular Norwegian public. Research Manager Sunde commented, 'Here in Norway, people in general are "not in my backyard". [...] This is strange. In Germany, I got the impression that the farmers are proud

to have a wind turbine in their backyard'. Again, opposition towards offshore wind energy was connected to a particular Norwegianness.

The NIMBY narrative was often told simultaneously and seen as consistent with the argument that placing turbines offshore is a solution to problems of public resistance. PhD Candidate Smith: 'It's very strange, but as long as it isn't in your backyard it is somehow great. As long as you don't see it, it is great'.

To summarise, an expectation of public resistance and a construction of the public as NIMBY were found in a majority of the interviews. Interviewees imagined a general public, or PiG (Michael, 2009), by referring to 'the Norwegians', 'people', 'the man in the street', 'ordinary people', etc. In addition, some specific publics, or PiPs (Michael, 2009), were mentioned as potential opponents – for example, the fishing industry, because of possible area conflicts at sea, environmental organisations, because of potential negative environmental consequences, and local communities protesting against developments in their backyards. Interestingly, constructions of negative publics were frequently related to particular supposedly Norwegian traits.

This narrative of the negative public could be described as involving some degree of cultural pessimism as the public was imagined as morally and intellectually deficient. Contrary to economic concerns, NIMBY opposition was constructed as something most scientists did not identify with, and hence as unreasonable concern. Although the interviews were about offshore wind energy, interviewees extensively referred to stories about experienced or mediatized opposition to onshore wind and pylons to make their point. It seemed as if they were transferring existing narratives about public attitudes to onshore wind energy, offshore. In that way, they constructed also offshore wind energy as an object of fear for the public.

Conclusion: Are scientists pessimists?

This paper analyses offshore wind scientists' constructions of the public(s) by identifying narratives within the offshore wind research communities in Norway. With Woolgar (1991), it could be claimed that the scientists' imagined publics have a configuring force in the sense that they construct identity and constrain action of the public. Maranta et al (2003) describe 'imagined lay persons' as functional constructs. Imagined publics may be performative in that they affect the design of the technology. Moreover, Walker et al (2010) argue that imagined publics may have greater influence than 'real' publics.

While earlier studies about imagined publics find widespread expectation of a resistant public, I expected offshore wind energy scientists either to imagine a positive or indifferent public or not to take the public into account at all, because turbines are to be placed far out at sea and thus 'out of sight, out of mind'. My analysis shows that most offshore wind scientists constructed ambivalent narratives about the public. On the one hand, scientists wanted to believe in offshore wind as sublime technology. They imagined huge floating turbines far out at sea, hoping the technology could be developed and implemented without having to consider the public. As Haggett (2008, p. 292) claims, offshore wind energy 'is seen as a good thing not just in its own right, but because it may be the answer to many of the problems encountered with onshore development'. However, scientists did not dare to fully believe in this promise, and constructions of a resistant public entered into their accounts. Only a few interviewees told a simple story based on only one of the identified narratives. Most told a more complex, messy and partly contradictory story. In their accounts, they moved back and forth between narratives. Thus, the 'phantom public' becomes 'real' and influential in most scientists' constructions while at the same time keeping its ambiguity and 'slippery qualities'.

The ambivalence may be explained with reference to the particular Norwegian energy context. On the one hand, there has been an official rhetoric enthusiastically describing offshore wind energy as technological sublime. On the other hand, the interviewed scientists continuously referred to Norway's history of public resistance to energy infrastructure, which, as we have seen, influenced their imagined offshore wind publics.

Furthermore, accounts addressing public attitudes about far offshore (out of sight), near shore and onshore wind energy were often mixed without their differences being made explicit. In the 'out of sight, out of mind' narrative, interviewees often referred to 'real offshore'. The difference between near shore and 'real offshore' was largely defined by distance and visibility, rather than by technology (e.g. bottom-fixed vs. floating). Hence, a distinction between near shore (as in sight) and offshore (as out of sight) would have been fruitful in this context (Haggett, 2008; Wolsink, 2010).

In addition to aesthetics, an economic framework was prevalent. This made offshore wind scientists largely imagine the public as mainly concerned with their self-interests. People were thought to support offshore wind when out of their sight and when it benefits their economy by creating jobs. They were thought to oppose offshore wind because they do not want it in their backyards or fear higher electricity bills. In contrast, constructions of the public as concerned with more common or altruistic values connected to, e.g., the potential of offshore wind to contribute to climate change mitigation or its dangers for biodiversity were rarely mentioned. This economic focus may be explained through the emphasis on cost-effectiveness in the research centers and economic issues prominently featuring in policy debates.

A construction of the public as positive towards offshore wind energy was nevertheless predominant in many of the ambivalent narratives. However, accounts of a resistant public and NIMBYs abounded in the interviews. Like in earlier studies observing the persistence of

NIMBY arguments (Burningham et al, 2006; Devine-Wright, 2011a; Wolsink, 2012), interviewees used the concept to describe the public, even though NIMBY-related worries were unsubstantiated according to the scientists, as expressed in the ‘out of sight, out of mind’ narrative. It is particularly significant that the NIMBY concept persists even in the context of offshore wind energy, where it could be expected to be resolved because turbines are placed at sea. Thus, although the NIMBY explanation for public resistance has been abandoned by social sciences (Burningham et al, 2006), the concept ‘has become a common shorthand’ (Devine-Wright, 2011a, p. 61) in other areas of society. In the offshore wind research community studied here, it was used in an act of othering to construct an irrational resistant public in contrast to the scientists’ rational selves. Hence, offshore wind scientists’ imaginings of publics involved boundary work. This is in line with Wynne’s (1995, 2006) and Irwin’s (1995) descriptions of a dominant scientific institutional culture or science-centered worldview, which produces deficit models of publics.

The imagined publics described here also portray a disembedding of the development of offshore wind technology. The dominant ‘out of sight, out of mind’ narrative was celebrating the idea of scientists not having to deal with the public because they would be either positive or indifferent. The NIMBY narrative constructed a resistant public as irrational ‘other’. By othering the public as irrational, the scientists delegitimise opposition. Thereby, they provide a space to develop the technology without having to consider the public’s opinion and values. Walker et al (2010) mention the potential to regard the incorporation of imagined publics as virtual public participation. However, in this case, the imaginings of the publics produced exclusion rather than inclusion, an othering of publics from the development of the technology. The implications of these ambiguous imagined publics for the design of the technology need further study.

This paper contributes to existing literature on imagined publics through the observation that the motor for scientists' constructions of publics is to balance between technological optimism and cultural pessimism, between offshore wind as sublime technology and an object of fear. As we have seen, Norway's particular energy situation and the country's experience with energy infrastructure controversies and the policy context play into the narratives of offshore wind publics. Also the institutional context of the research centers, e.g. the focus on cost-effectiveness, may have influenced the imagined publics.

Particularly, the perceived resistance towards onshore wind energy seemed to be transferred to offshore technology, in contrast to observations of a public largely positive towards onshore wind energy (Karlstrøm, 2010; Rygg, 2012). Besley and Nisbet (2013, p. 656) suggest that scientists' misperceptions of public opinion may be a result of 'pluralistic ignorance and false consensus – a failure to realize when one's own opinion is in the majority or minority, respectively'. Furthermore, scientists blamed negative media coverage for causing public resistance even though the coverage is mainly positive (author, forthcoming). Thus, scientists themselves could have been victims of the "hostile media effect", i.e. that people with a strong interest in an issue 'tend to view even favorable coverage as slanted against their goals and point of view' (Besley and Nisbet, 2013, p. 656).

To conclude, scientists' constructions of publics involve constructions of the scientists' selves. Considering the surprisingly high prevalence of constructions of negative publics, the question could be raised whether the scientists' constructions of ambivalent publics mirror a pessimistic engineering mindset? The presence of the narrative of a resistant public could point to a general (unconscious) insecurity or fear among scientists and engineers, especially related to wind energy, to be criticized or to fail because of public protest. This could have consequences both for the design and siting of the technology (floating far offshore instead of bottom-fixed near-

shore), for how the scientists engage with publics and how they view the perspective for offshore wind development in Norway.

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