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Reframing Decommissioning as Energy Infrastructural Investment:

A comparative analysis of motivational frames in Scotland and Germany

Decommissioning is often understood to mark the end of an energy infrastructure, associated supply network or even an entire industry. The long-term nature of this process for large scale infrastructure offers, however, a strategic opportunity for businesses. The paper argues that pro-industry Scottish business interests have proactively reframed decommissioning oil and gas infrastructure as an investment opportunity, whereas their German counterparts in the nuclear industry have struggled to mobilize a positive reframing of the phase-out. A detailed analysis of eighteen interviews reveals critical insight into how each industry approaches mobilizing support for their interests through motivational framing in the decommissioning context. Four key differences between the case studies (materiality, industry trajectories, rise of small business and national political identity) are then identified and reflected upon.

Keywords: decommissioning; energy investment; energy infrastructure; oil and gas; nuclear; political economy

1. Introduction: *Decommissioning and Energy Investment*

National projects of development are closely associated with calls for investments in energy infrastructure based upon the urgent need to promote economic growth, secure energy service provision and meet the demands of transitioning to a low carbon economy. The assumptions inherent in this connection is that investment equates to the development of new infrastructure [1-3]. As the world moves away from undesirable energy sources, urgent investment is needed to decommission long-standing associated infrastructures. This paper investigates the different ways in which the oil and gas industry in Scotland and the nuclear industry in Germany have

sought to cope with the detrimental impacts on their industry from decommissioning processes. The results of this study reveal that former has resisted through reframing decommissioning as an opportunity to revitalise the industry, whilst the latter frames decommissioning as a direct threat to its industry and affected communities.

The world is set to invest around \$300 trillion in renewable, fossil fuels and nuclear energy to meet this demand [4, 5]. Over three quarters of this total is estimated to be renewable [6]. Oil will continue to be the world's leading energy source with increase in the use of gas likely to endure [7, 8]. This investment will involve fuelling current energy systems, but above all, the creation of new supply chains, technologies and multiple impacts [9-11]. An additional substantial cost that is often overlooked is the unforeseen size of investments needed for the large-scale decommissioning of fossil fuel and other undesirable energy infrastructures. The modern global energy system built after World War II has little experience¹ of how to deal with international divestments from entire energy systems and how their associated infrastructures can be dismantled. The transition towards clean energy will involve new systems of provision but also of rejection.

The paper seeks to contribute to our understanding of how political power and forms of rule are contested and how questions of energy infrastructure are made meaningful for different publics [12]. Whilst the politicisation of investments in new infrastructure is well-established [13-15], this paper adds to our existing knowledge by shedding light on similar processes in relation

¹ There many instances of decommissioning power plants and associated facilities through technological renewal (e.g. Magnox nuclear reactors in the UK or the replacement of town-gas facilities or coal combustion with natural gas). More recently, the phaseout of coal in the UK offers an example of a wholesale phaseout of coal mining, bunkering and combustion facilities.

to investing in decommissioning. It investigates the ways in which Scottish and German business interests strategically frame, and reframe, decommissioning of the oil and gas and nuclear industries respectively.

The oil and gas industry is a major source of tax revenues, providing over £300 billion since the late 1960s. This amounts to a direct UK wide tax take of 1% in GDP, with much larger impacts on other sectors of the economy. It is strategically important for Scotland. It is estimated to be worth £17 billion to the Scottish economy, almost double of the Scottish low carbon (including nuclear) and renewable sector [16]. Decommissioning activity in Scotland is valued at around £10 billion over the next 10 years, potentially reaching £40 billion by 2040 [17]. As a slight higher national GDP (to the UK), German nuclear energy is less strategically important, nor is it tied to nationalism in the same way as in Scotland. Fossil fuels continue to dominate German national energy consumption. The tactical importance of nuclear is in relation to low carbon politics and its transitional role in supporting (or hindering) the growth of renewable energy sources [18].

The paper focuses on how each industry frames the decommissioning of their national infrastructure within these contexts. Framing studies are most closely associated with social movements and resistance [19-22]. There is also a key set of framing literature on media and political communication [23]. This study contributes rather to framing studies from the perspective of elites or elite organisations such as political parties, government, supranational authorities [24-28]. It investigates the framing processes of business interests in resisting threats to their industry. Framing perspectives can offer insight into how elite organisations strategically manoeuvre [29]. Three strategic processes are identifiable as diagnosis (framing the problem),

prognosis (the solution) and motivational (the incentive) framing [19]. The focus here is on motivational framing [30-32] from the perspective of elite business organisations.

The next section outlines the contribution to literature through elaborating on motivational framing and energy companies. The third section details the research process undertaken and the context in which it took place. The results of eighteen research interviews with Scottish and German business interests are outlined. It then discusses the implications of these results for understanding elite framing processes, as well more specifically why the two industries framed differently in each case. Some final remarks conclude on the implications for exploring decommissioning in future research.

2. Literature review: *Motivational framing and energy companies*

Framing is an implicit strategic action for business organisations. It is more than the identification of key problems. The business engages in active manoeuvring to ensure that these problems are framed in a way that benefits its members or stakeholders. It explicitly implies agency – as we see below there is a lack of agency on show from the German nuclear industry than the Scottish oil and gas industry. The process is inherently strategic. It differs in both form and process from lobbying where a direct influence of one actor over another is sought [33, 34]. In such processes, scholars often explore direct causalities in assessing policy or decision outcomes. Framing is more closely associated with discursive strategies. In this way, business organisations not only seek to influence markets or political interests. They actively engage in their constitution [35]. Research on framing processes [36, 37] is, however, less (albeit still) concerned with extrapolating power dynamics to the same extent as we find in studies on corporate discourse [38-40]. The primary

aim of strategic framing is to “mobilize potential adherents and constituents, to garner bystander support, and to demobilize antagonists” [19]. Framing, often referred to as collective action framing² [20, 21], is therefore most associated with social movement studies, rather than the assessment of corporate behaviour.

This paper seeks to adapt collective action framing [19] mostly associated with social movement literature [41, 42] and media and political communication studies [23] to enrich our understanding of elite framing processes to gain a more comprehensive understanding of the ways in which businesses garner support for their strategic benefit. Collective action frames are understood to be the properties of organizations or groups of individuals within the context of social movements such as policy-makers, NGOs, interest groups or pressure groups. Social movement scholarship has sought to expand upon how social movement organisations use spatial tactics in their framing strategies to resist policy change. Many scholars have demonstrated that policy actors employ spatial tactics (although not explicitly engaging with the collective action framework) in various beneficial ways within the context of multiple interactions taking place at different scales [25, 26, 43-45]. Kurtz [44], Harrison [43] and Sze *et al.* [42] use the notion of scale frames to encapsulate the discursive practices that construct links between the scale at which a social problem is experienced and the scale(s) at which it could be solved. As set out in section 5.1 below, I argue that a focus on the collective action framework, especially motivational framing, allows for deeper understanding of strategic framing.

² Collective action frames are the products of a group of agents in society who actively engaged in the “production and maintenance of meaning for constituents, antagonists, and bystanders or observers” (Benford and Snow 2000: 614). They are traditionally viewed within the context of social movements, rather than business.

Benford and Snow [19] refer to three key components that are present in collective action framing processes. Diagnosis framing identifies what the problem is, while prognostic framing involves the articulation of a proposed solution [41]. Motivational framing – the focus in this paper – refers, thirdly, to the construction of motive [46]. Beckwith [47] comments further, “collective action frames, in organizing and making sense of lived experience and perceptions, serve to focus and to summarize grievances, to organize action, and to posit opposition and solutions”. Such collective action frames can belong to activist [19-22] or elite organisations [24-28] who aim to strategically frame common purpose to achieve an agreed outcome.

The collective action framework is used to understand the *motivational* framing processes of businesses. This work is situated within some existing research on corporate strategies towards motivating frames that seek to mobilize support or demobilize antagonists. For this reason, Gamson and Wolsfeld [48] refer to motivational framing as the “agency component of collective action frames”. Maijanen [30] reveals, for example, how the Finnish broadcasting company was unable to successfully motivate a shift away from pro oil and gas frames in covering energy issues in the broadcasting sector over a 40-year period. Markowitz [31] demonstrates how socially responsible mutual fund companies have assumed the same techniques as social movement organisations through seeking to create a “SR” (socially responsible) identity among investors. After assessing 34 mutual fund companies, she found that businesses actively sought value alignment to attract investors. In contrast, Kreps and Monin [32] find in similar research that such instances of value alignment was in fact rare.

Research in this area is less prevalent within the context of large energy companies, or more broadly understood as elite corporate organisations. Motivational framing has tended to

be more associated with non-traditional businesses such as mutual fund companies [49] or fair-trading organisations [50] as explored above. The focus has been placed on mobilising support for ethical or moral value-based outcomes [35]. This paper uses motivational framing on conventional large energy companies. In an assessment of industrial organisations, Schlichting [51] argues that the majority pursued motivational framing of scientific uncertainty in the mid-1990s with the purpose of demobilise and support for the Kyoto negotiations in 1997. Utz, Kleinnijenhuis, van Atteveldt, Schultz, Kleinnijenhuis, Oegema, Utz and van Atteveldt [52] shows how BP (British Petroleum) attempted to disassociate itself from being responsible for the Deepwater Horizon crisis through framing attributional blame on governmental actors.

3. Methodology

This section outlines the primary methodological considerations for conducting research on the framing processes used by energy companies to mobilize support or demobilize antagonists through motivational framing decommissioning processes in Germany and Scotland. It also covers the details of the research context with regards to the scale of investment in decommissioning practices in the oil and gas and nuclear sectors.

3.1 Research process

The oil and gas industry in Scotland and nuclear sector in Germany are selected based upon their prominent role as major national decommissioning projects. The field data used in this paper are derived from eighteen anonymous (ten interviews with Scottish representatives of the oil and gas business and eight business representatives of German nuclear industry) semi-structured

qualitative interviews, which focused on understanding how motivation was articulated on the decommissioning issue. Business within this context is defined as profit making corporations or pro-industry lobbying groups. The interview questions explored the whole energy system for both oil and gas and nuclear, which is not explicitly explored in detail in this paper due to space. In terms of analysis, the paper follows the nuanced non-linear approach of Rehner and McCauley [18], by using a top down method imposing the conceptual framework of framing above upon the data in coordination with a bottom-up approach in allowing the data to guide the researcher on the selection of some nodes. This allowed for the use of coding the key framing processes of diagnosis, prognosis and motivation. I added to this the three broad key stages in energy cycles of mining/drilling, generation and waste and a rudimentary approach to coding for scale as local, national and international.

The research is therefore built upon elite interviews to understand the strategic framing processes that are used. An elite has a position of authority exerting more influence than a member of the public [53]. This approach which is often used in energy policy as a means to better understand the context and assumptions that infiltrate decision-making [29]. It is primarily used in relation to qualitative research. It is therefore constructivist, in search of uncovering subjective interpretations [54]. Interpretivism reinforces the idea that social action is interpreted, in this case, by elite organisations. It reminds us that their interpretations of reality are in constant revision necessitating systematic analysis in unison with the acknowledgement of the researcher's own realities impinging on such analysis [55]. Anonymity was given to interviewees to allow for the development of strategic framing which may be confidential in nature. This research is therefore limited by its dependence upon the views provided by interviewees on

behalf of organisations. An important implication is the timing of interviews which all took place in 2015 and 2016. It also lacks a mixed methods dimension. And thirdly, the results are limited to the oil and gas and nuclear sectors within each national context. There are nonetheless some important conclusions for practice and theory as outlined in the discussion section.

3.2 Research context – investing in decommissioning

Decommissioning oil and gas is a major national project for Scotland and the UK more generally. The drop in oil price in 2014 resulted in a strategic reflection on behalf of the oil and gas industry to withdraw from older mature basins such as that found in the North Sea. There are 21 oil and gas companies with offices in Scotland and over 100 companies in Scotland already involved in substantial decommissioning work in the UK continental shelf. The existing infrastructure to be decommissioned includes 302 oil and gas installations, 373 subsea installations, 16,000km of pipelines and more than 5,000 wells [17]. Decommissioning activity in Scotland is valued at around £10 billion over the next 10 years, potentially reaching £40 billion by 2040. It is estimated that these activities could support around 20,000 additional jobs [56, 57]. The Green Party chairman estimated in 2016 that decommissioning based jobs as well as investment in clean energy could both lead to over 150,000 jobs created in the next 10 years [58].

Uncertainty remains with regards to who is going to contribute to this significant investment. In 2012, the Scottish energy minister insisted that the UK (not just Scotland) had “a moral obligation” to contribute towards decommissioning costs [59]. The revenue enjoyed by the UK government promises difficult questions surrounding who should pay for the clean-up [60]. Shell has also been heavily criticised for a proposed strategy that would see the remnants of many oil

rigs left in the sea in order to cut costs [61]. Wood Mackenzie reported in late 2016 that taxpayers in the UK will need to contribute around £24 billion to the decommissioning of oil and gas rigs, leaving companies to spend around £50 billion at a conservative estimate [62].

The decision of the German national government to phase out nuclear power after the Fukushima disaster in 2011 has resulted in the most comprehensive nuclear decommissioning challenge faced by a developed nation with a total of 17 reactors (as well as 30 research reactors of various sizes) [63]. The size of investment needed to complete the decommissioning of nuclear power plants in Germany is a similar undertaking to that of oil and gas in Scotland. The market for nuclear decommissioning services will double to around €9 billion by 2021 [64]. This figure is due to rise substantially considering that the timeframe for decommissioning a power plant is around 20-40 years in most cases as it incurs an annual investment. Callan Associates provide a conservative estimate of around €1 billion for the decommissioning of one standard nuclear power plants that generates around 1 GW of electricity [65].

Unlike oil and gas decommissioning in Scotland, the question over who pays for the investment needed for decommissioning has been put centre stage by a high-profile court case. German energy companies had already put aside €40 billion to cover the cost of decommissioning reactors, restoring the land and disposing of the nuclear waste. In late 2016, Germany's utility companies were informed that they would have to pay €23.3 billion plus interest, in addition to the €40 billion set aside [66]. This led to direct sharp increases in the shares held by two of the most prominent companies Eon and RWE as the largest contributors, followed by Vattenfall and Energie Baden-Wuerttemberg AG. New connections have been made between German and other European energy companies (especially Bechtel) in early 2017 to deliver decommissioning.

With these two national contexts, the next section investigates the key motivational frames of ‘job creation’, ‘investing in communities’ and ‘technological renewal’.

4. Results

The analysis below presents the research interviews that were conducted in accordance with the methodology set out in point 3.1 above. For the purposes of this paper, three major results categories emerge, or *motivational frames*, that demonstrate the strategic framing processes of business representatives in Germany and Scotland. ‘Job creation’ is a recurring theme across all research interviews, alongside ‘investing in local communities’ and ‘technological renewal’. Representative coded material is taken from the coding processes of these interviews to demonstrate the ways in which pro-industry organisations frame decommissioning practices in the oil and gas and nuclear sectors.

4.1 Job creation

The first motivational frame for business is ‘job creation’. Scottish business representatives adopt a distinctly positive approach towards the framing of employment issues with regards to decommissioning activities. Seven out of ten interviewees explicitly mention the term “opportunity” in relation to employment in the oil and gas sector. Three interviewees emphasise that decommissioning will take place alongside continued oil and gas extraction from the North Sea. From their perspective, new decommissioning jobs would be added alongside existing extraction related long-term employment. The problem is therefore framed as an opportunity for the future development of the industry.

“We are expecting to witness a substantial rise in job opportunities throughout the sector...[e]asily offsetting what many communities are experiencing here in the north-east...[w]e may need to see an influx of differently skilled people...[r]emember, we can call upon many skill sets throughout the company quite easily. But I want to focus on the opportunity here [for the local population] to benefit from decommissioned activities, especially over the next 25-30 years” (business #3)

Investments in fossil fuels is often understood to be a barrier to the development of renewable energy [67]. Subsidies, hidden or otherwise, can maintain loss-making industries [68-70]. However, four out of ten interviewees presented the decommissioning of oil and gas as part of a broader commitment to promoting renewable industries in Scotland. Decommissioning jobs are framed as “green jobs”. They seek to build upon an image of oil and gas enabling a greener future for Scotland. Two interviewees raised in depth the need for Scotland to become a “world leader in decommissioning activities” not only for fossil fuels but also for renewables. Systems of decommissioning are, in their eyes, transferable. Throughout, the job creation argument in relation to supporting green jobs is apparent in the industry’s strategic framing.

“I would see this as part of the green jobs package, the transformation of the energy sector more generally, the transition towards a more mixed energy system with both fossil fuels and renewables... I could see us establishing ourselves as the experts not only in attracting renewable companies to invest here but also on how to decommission

energy technologies, both renewable and non-renewable. There are many possibilities”
(business #2)

In sharp contrast, there is no evidence of such connections in the eight interviews conducted with German business representatives. The idea of job creation was routinely dismissed. Each interview presented evidence of framing the negative consequences in terms of job loss. There is also no connection with the development of green jobs raised in any interview. Instead, interviewees focused on the need “to wake up” to the underestimated implications of phasing out from nuclear. All interviewees decried the negative influence of shifting government policy towards nuclear phase out. Five interviewees all raise the issue of the supply chain dynamics in job losses. They cite the lack of awareness of government and the public at large.

“[Y]es, there are around 400,000 people working in the nuclear industry (in Germany). But this does not get close to the real number, you could double that when you take into account the supply chains involved...[p]eople have not woken up yet to the damage that this will do to communities throughout Germany and beyond.” (business #15)

4.2 Investing in communities

Fossil fuel companies often make the case for large-scale investment in local communities including and beyond the jobs argument [71]. It is a motivational frame for business in so far as decommissioning may affect levels of investment in communities. This has led to communities of dependence in many areas of the world whereby local populations become reliant upon fossil

fuel investments [72-74]. This connection is evidently developed within the Scottish industrial frame of decommissioning – but from an optimistic perspective. All ten interviews with Scottish representatives underline the transformative potential of new employment requirements for the industry. Six interviewees connect new skills development with direct investment in onshore communities throughout Scotland. The frame of job opportunity is intimately linked to local investment.

“The dismantling of an oil rig is quite a job you know! You need different people [in contrast to those needed for continued extraction activities]. It is not just a technical problem of moving millions of tonnes of kilos from the sea to land. We need engineers, logistics experts especially shipping, divers and those used to working underwater, never mind the biologists and marine experts when we think of avoiding the potential impacts...[w]hen you think of it, this will involve long-term substantial investment in Scottish universities, centres of expertise as well as local businesses in order to ensure that the right skills are on hand” (business #7)

The nuclear phase out is framed as divestment in local communities within the German context. The decommissioning process is not perceived to be a replacement, neither short- or long-term for any of the interviewees. The results point towards an industrial strategic frame in relation to local communities based upon the destruction of social cohesion built around the complex local supply chains of the transportation of materials, generation of electricity and the management of waste. Cities, towns and villages are placed at the sharp edge of decommissioning.

“Take the example of Biblis, I don’t know if you know of it, its nuclear reactor was taken off-line five years ago [in 2011]. It is a beautiful town on the banks of the Rhine River. Do your research, speak to anyone, it has been a disaster. The local economy has really suffered.” (business #11)

The interviewee continues with a detailed account of the ways in which the town has lost its identity. He provides some insight from personal experience and family members. The account is presented in highly emotive terms such as “irrevocable” and “left behind”. There was no connection between the decommissioning work at the site and the reorientation of local skills, jobs or investment opportunities. Instead, a different interviewee (business #13) evokes the entry into the market of Swedish decommissioning specialist businesses involving their own workforce. There was no sense of revitalisation or new investment for localities in their resistance frame.

4.3 Technological renewal

Scottish oil and gas representatives are, thirdly, strategically framing decommissioning as an opportunity to explore technological renewal – i.e. the claim that new technological advances will challenge the logic of decommissioning or phasing out the energy source. The promise of future more reliable and cleaner technologies has been made by fossil fuel industries in several other locations throughout the world [75, 76]. It mobilises a public sense that the industry is not finished but rather on a path towards renewal. The first technological renewal frame in the

Scottish context is Carbon Capture and Storage (CCS). It emerges in relation to the cost implications of decommissioning, whereby oil and gas rigs are put to different uses other than extraction.

“CCS is part of our future. We are all simply waiting for the right time, and perhaps this time is coming sooner than we think... The Peterhead example gives you an idea of the potential.” (business #6)

The existing framework of pipelines from offshore rigs was intended to be employed as a means for showcasing CCS technology in storing carbon-based pollutants from Peterhead power station out at sea. This would have meant that decommissioning would not be necessary in its entirety for the rig and associated infrastructure. In late 2015, the UK government did not finally invest in the idea. This example demonstrated both the potential and the challenge of the “technological renewal” frame for the industry. (Only) one interviewee explicitly raised the potential of the industry’s renewal in a future shale gas boom in Scotland.

“The Scottish government is against shale gas exploration today, but who knows about tomorrow... [the oil and gas industry] does not work on a four or five-year basis, we need to think long term.” (business #1)

The nuclear industry in Germany continues to frame decommissioning as loss in this motivational frame, rather than gain. The highly technical nature of nuclear electricity generation was

consistently raised throughout all interviews as leading to a comprehensive well-established research community that is world leading. It is understood to be a national asset that will decline rather than renew. No representative from my interviews emphasise the possibility of future technological renewal (for example smaller modular nuclear reactors, thorium etc.) or alternative uses. All eight interviewees instead pointed towards the loss of technical knowledge and expertise.

“We are simply giving up on generations of highly technical expertise and knowledge. The nuclear research community in Germany is extremely mature, collaborating with experts across Europe and especially in France... [w]e have given a signal that all this technological knowledge, we are no longer interested in this... [y]ou never miss something really until it is gone... [w]e don't just pay a financial cost, we pay a social one too” (business #12)

The oil and gas industry in Scotland has therefore strategically framed decommissioning as an opportunity in relation to the development of new employment opportunities, investments in local communities and business as well as a platform for technological renewal and alternative use. The German nuclear industry has framed all three dimensions as a threat to be opposed. The next section reflects on the implications of these two contrasting strategic frames.

5. Discussion: *Reframing Decommissioning*

National projects of development are usually considered to be associated with the development of energy infrastructure on a large scale with the explicit intention to open new long-term energy

futures [77, 78]. The decision of the French government in the post-World War II era to prioritise the development of nuclear power plants throughout France is a classic example [1]. Successive French governments framed nuclear energy as a cheap, affordable and more recently low carbon energy solution for developing industry and serving homes [79, 80]. This paper reminds us that projects of national importance can also involve the wholesale removal of energy infrastructure. We must assess with equal vigour the strategic framing processes of energy companies in relation to decommissioning. Overall, the Scottish oil and gas industry frame the problem of decommissioning as the challenge of reorienting the pre-existing extraction activities towards building social and economic capacity to deliver decommissioning. The German nuclear industry frames decommissioning as a threat, imbued with a sense of resignation, to the industry's future, as well as to the social and economic capital of multiple localities. Motivational frames are reflected upon in more detail before considering the broader implications for understanding decommissioning contexts.

5.1 Motivational frames in decommissioning

In contrast to Daviter [25] and Eising, Rasch and Rozbicka [26], strategic framing processes are more than problem or issue definition. Gamson and Wolsfeld [48] and Benford and Snow [19] remind us that motivational framing implies much greater levels of agency. Strategic framing processes entail attempts by organisations or various interests to influence what the solutions ought to be and how to inspire their delivery. Leitner, Sheppard and Szaiarto [81] demonstrate how national political parties enact such processes. There is a notable divergence between the

strategic framing processes of the Scottish oil and gas and German nuclear industries. Put simply, the former seeks to proactively construct motivational strategic frames whilst the latter does not. This is a timely reminder that framing processes do not occur naturally. Organisations or individuals must consciously engage in framing problems and solutions. This supports the foundational work of Tilly [82] insofar as framing is a “deliberate process of choice”.

The framing strategy of the oil and gas industry in Scotland puts forward the challenge of reorienting the workforce from extraction-based expertise to decommissioning is substantial investment into educational facilities and local businesses. The Scottish frame avoids explicitly taking sole responsibility for delivering such an investment, but rather sets up the endpoint needed to achieve the solution for reorienting the workforce. In this way, the solution outcome of investing in communities is localised, but the mechanism for achieving this is nationalized - for example it is claimed to be “part of the (nation-wide) green jobs package”. A similar process is observable for technological renewal where national government is identified as the primary mechanism for enabling or disabling future alternative solutions.

Motivational framing is also characterised by the development of vocabularies of motive as demonstrated by Boykoff and Laschever [46] in their analysis of the Tea Party movement. German business interests routinely use negative emotive vocabulary such as “disaster”, “suffered”, “irrevocable” and “not woken up yet”, designed to mobilise a sense of urgency and to display the sense of threat posed by decommissioning. In contrast, Scottish businesses employing more positive emotive vocabulary such as “substantial rise in job opportunities”, “benefit”, “substantial investment” and “potential” to underpin their overall framing strategy of

considering decommissioning as an opportunity to reorient the industry, rather than see it diminish.

5.2 Why did each industry respond differently?

The two different approaches to motivational framing must be considered within the broader political economy of decommissioning in Scotland and Germany. Four key factors are identified from the results that need to be considered when understanding why the Scottish oil and gas industry undertook a more optimistic and proactive framing in contrast to the resigned and negative approach of the German nuclear industry: (1) materiality vs. perception (2) industry trajectories (3) rise of small business and (4) national political identity. As outlined in section 3.2, both industries have a long history of investment in terms of infrastructure, human and financial capital. The maturity of the oil and gas basins in the North Sea ensures that decommissioning is a certain and imminent prospect [62]. The industry has time to accept this material reality, and re-position its future relevance.

In contrast, the German nuclear industry has no similar national specific long-term material limitations. Supply chains are well established. Production facilities remain online. Waste disposal and reprocessing are in place – all three not without their issues. Demise, unlike for Scottish oil and gas in the North Sea, is not materially inevitable. Re-orienting infrastructure for the benefit of new technologies such as CCS, fracking and offshore wind are more possible than for nuclear. The decision to phase out in Germany is therefore more abrupt, politically and socially accepted.

Reframing its future relevance, motivating supporters, and demobilizing antagonists, become difficult and requires more imagination than currently demonstrated [19].

The divergence in motivational frames can be explained, secondly, from the contrasting trajectories of oil and gas and the nuclear energy sector. Within an industrialised economy perspective, both industries are under pressure from the upsurge in renewable energy investment such as wind and solar [83]. The results from the interviews conducted above suggest that technological renewal (in section 4.3) is, however, more evident from the oil and gas sector than from nuclear. The future potential of CCS, shale gas as well as offshore wind development are points for optimism. In the Scottish case for example, the moratorium on shale gas is temporary [84]. The absence of technological renewal in the German nuclear industry is confounded by increasing security concerns around existing nuclear technologies. The Fukushima disaster renders a positive framing around nuclear impossible without some form of optimism connected to technological renewal possibilities. The different industrial trajectories are therefore key explanatory factors in the framing processes outlined above.

The phase-out of nuclear energy must be understood within the context of the rise of small business in Germany. The four large German energy companies invested significantly in nuclear technology, building a post-war nuclear fleet [83]. Their interests are firmly rooted within the continued successful nuclear industry. The decentralisation of energy capacity in the 1990s, alongside the rise in feed in tariffs, succeeded in breaking the dominance of the big 4 [85]. Fukushima represented the relative demise of the big 4 in political terms in relation to nuclear energy, in the face of emerging small businesses [63]. Within this national political context, mobilising supporters for nuclear was problematic. In contrast, Scottish national energy

companies are less associated with supporting investment in oil and gas. The small business sector in energy is also less mature. The Scottish business context was, in contrast, less divided. Motivational framing was, in this setting, more plausible in garnering support for a positive approach to decommissioning.

Political identity is a fourth explanatory variable for the diverging approaches to motivational framing. Returning to the example of France, the nuclear industry is intertwined with national political identity in way that makes decommissioning improbable. Its development is engrained into the French political elite as a “symbol of national glory” [1] in a similar way to coal in Poland [86]. Oil and gas have a similar tie to Scottish nationalism. Writing over forty years ago, Rose [87] comments that oil revenues are the key to independence in “being free from the growing balance of payments deficit and economic ills of England”. A view repeated today [88]. Oil is culturally embedded in the independence psyche of Scottish nationalists [89] despite open recent attempts to embrace the transition to renewables [90, 91]. No such connection exists in Germany. Renewable energy is, in contrast, a potentially motivating symbol of national renewal [92, 93].

6. Conclusion

Framing, and reframing, within decommissioning contexts are sensitive to time. Energy companies will continue to strategically manoeuvre around framing problems and solutions for utilitarian gain. These frames are therefore multiple, and extremely fluid across space and time. This investigation reveals two contrasting responses to decommissioning of energy infrastructure. The Scottish case demonstrated how business interests proactively reframed the

national project of decommissioning North Sea oil and gas as an opportunity to reorient the industry. Similar interests in Germany were more reactive and negative. The long-term replacement of fossil fuels or other undesired energy sources will lead to the increasing need of decommissioning processes. We are increasingly cognisant of future investments in new energy sources. This must also be accompanied by an adequate level of investment in deconstructing infrastructure. Investing in infrastructural deconstruction will also “do political work” for political and business elites. We therefore need more research into the ways in which such elites frame and reframe to hold onto power. Collective action frameworks may prove fruitful for investigating how such elites manoeuvre within the context of decommissioning in future research.

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