

Nudging policymakers: a case study of the role and influence of academic policy analysis

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ABSTRACT

As countries around the world face the monumental challenge of transitioning to low or net zero carbon economies, there is an important opportunity for public policy and political science learnings and models to underpin crucial shifts in policy strategies and decision-making in an arena dominated to date by technical thinking and problem-solving. In this essay we demonstrate how we, as academics working in the fields of political economics and engineering, employed policy science knowledge about building coalitions around polysemic ideas to advance the debate about large scale (industrial decarbonization) climate change solutions in the UK.

KEYWORDS Climate policy; consensus; narratives; policy windows; polysemic ideas

Introduction

Our aim in writing this essay is to present our experience in playing a direct role in advancing policy discussions on the potential use of carbon capture, use and storage (CCUS) in the UK as a demonstration of the value of academic knowledge in framing policy decisions. We are a team of two academic economists (homed in a School of Government and Policy) and an academic engineer (from an industry background), with a track record in academic and policy circles for applied political economy focussed contributions to policy debates around the role of CCUS and other decarbonization solutions in addressing the challenge of climate change and the transition to low or net zero societies or economies. In late 2017 we were asked by officials at the UK Department for Business Energy and Industrial Strategy (BEIS) to help the Government reframe the debate on climate change in general and CCUS in particular, with the specific aim of fostering a more consensus driven approach.

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What we present here is a case study based on our experience in considering the role and application of public policy and political science learnings and models in developing ideas and narratives. In particular, our case study focuses on how academics can play the role of policy entrepreneurs in exploiting policy windows to use ideas and narratives as coalition magnets that empower and nudge policymakers in developing strategies to address the challenge of meeting ambitious climate change targets.

We hope that the particular focus of our case study will help other policy scientists to take advantage of the policy window in the arena of climate policy and 'net zero' pathway and policy formulation. This policy window remains very much open in the UK, particularly since the 2019 declaration of the Government's ambition to transition to a net zero economy by 2050.¹ For example, the Westminster Parliament is currently in the process of further broadening consultation on delivering the net zero transition, not least by convening a Citizen's Assembly.² Thus, one of our aims in writing for this Policy Forum is to help set foundations for other public policy analysts to inform and impact the development of policy strategies and actions in the broader 'net zero' domain.

The evolving climate policy challenge and the opportunity to position ourselves as policy entrepreneurs

In the wake of the UNFCCC (2015) Paris Agreement, and anticipating the advice of the UK Committee on Climate Change (CCC, 2019) to set targets for a 'net zero carbon' economy by 2050, a policy window opened in the UK as Government acted to stimulate a range of consultative processes around what such a target implies and potential routes to achieving it. Despite academic and policy debates, and climate policy still largely dominated by technology-focussed questions, we recognized that Government's concern lay in the fact that the net zero transition is a challenge that requires transformative and system level changes in how people live and do business. It had begun to reconsider its approach to climate and underpinning energy policy, until then the responsibility of a single ministry (the Department of Energy and Climate Change, DECC), in a broader public policy context. This was reflected in a restructure of Whitehall departments, with DECC merged into a new Department of Business, Energy and Industrial Strategy (BEIS) and with HM Treasury (the overall economic and finance ministry in the UK) taking a more prominent role in reviewing policy targets and actions. The transformational nature of the new twenty-first Century challenge of transitioning the economy to a point where there is no further negative impact on the global climate also arguably led to the opening of the policy window of albeit constrained consultation in the top-down Westminster model of government (Richardson, 2018). Here, we as a team of policy scientists recognized that government officials

and politicians were activity seeking support for – and possibly sharing of responsibility in – a process of identifying and pursuing pathways for a net zero transition that would be at the same time technically effective and viable in a political economy context (Dudley, 2013).

In positioning ourselves to participate in the policy process at this point, we focussed on the crucial implication that social and political science research foundations, combined with enhanced stakeholder engagement, must become increasingly important in supporting the required policy environment. We already had an existing portfolio of research – largely funded by the UK's publicly funded research councils – focussing on the political economy implications and context of decarbonization actions, and already delivering high relevant outputs.³ Thus, we secured 'Impact Accelerator' funding from the Engineering and Physical Sciences Research Council (EPSRC) and approached BEIS officials with the offer of partnering in exploiting our work and expertise in resetting policy questions and developing new ideas and approaches in advancing the policy debate.

At this point we presented BEIS with a basic idea that builds on the knowledge and evidence base provided by our research. The idea focuses on the need to decarbonize while sustaining the contribution of high value industries in generating jobs and incomes. We were at the time having discussions with various teams in BEIS (and with HM Treasury regarding analytical approaches). However, we focussed on setting the idea in the context of a potential role for large-scale CCUS in delivering industrial decarbonization policy may ensure a 'sustained contribution' to the UK economy from our (high value) energy supplying and intensive-use industries (and their respective supply chains). CCUS a technological solution that 'cleans' production processes by capturing CO₂ before it enters the atmosphere and transporting it for use in other processes or geological storage. It is increasingly regarded as necessary if the deep decarbonization ambitions of the 2015 Paris Agreement are to be achieved (IPCC, 2018). On the other hand, it is also a very costly solution with a troubled policy history in the UK, by and large for fiscal and economic reasons (set out below).

Thus, our 'sustained contribution' idea was an appealing one to BEIS officials, who were more generally challenged in their newly formed ministry to find a route to co-existence of action to support (a) the need for powerful dynamic change implied by the UK's climate change ambitions and (b) the stability of industry policy. That is, there was a clear need to shift away from embedded perceptions of economy-environment rivalry (Dudley & Richardson, 1996).

Of course, our 'sustained contribution' idea is applicable in other contexts. However, CCUS context was of particular interest to BEIS at the particular time that we offered to partner with them on our EPSRC Impact Accelerator work. It also provides the best example for the case study we present here. This is because a set of circumstances developed through which we could articulate

our idea and gain legitimacy for it within the community where a strategically important coalition could form.

The particular policy challenge for CCUS: tailoring our idea and role as policy entrepreneurs

The response of BEIS officials to our offer of a partnership was to request that we build on our recognized expertise in analysing the wider political economy implications of different activities, with the aim of developing our idea into a narrative around the potential role of CCUS in decarbonizing high value UK industry sectors. Crucially, they asked if we could work to build consensus around that narrative across a community of industry, technology and policy stakeholders, and to do so within the framework of a CCUS Cost Challenge Taskforce (CCTF) being set up on the instruction of the (then) UK Minister of State for Energy and Clean Growth (Claire Perry).⁴ The aim of the BEIS officials was to build and secure the support of existing CCUS stakeholders and experts in for potential Government support for CCUS in the new context: the newly formulated UK Industrial Strategy (BEIS, 2017). The need for consensus building was amplified in the case of CCUS, where a troubled history of repeated withdrawal of Government support for previous pilot studies and programmes (generally focussed on decarbonizing the energy system rather than industry) had culminated in the (then) Chancellor of the Exchequer, George Osborne's much lamented (among CCUS developers, researchers and industry stakeholders) decision to withdraw support for the most recent CCUS development programme (the CCUS Commercialisation Competition) in his 2015 Autumn Budget Statement.⁵

The Budget Statement itself did not provide an explanation for this decision, but a subsequent spending review by the National Audit Office noted that, while agreeing with the (then) Department for Energy and Climate Change (DECC) that CCUS is required to meet UK carbon targets, 'HM Treasury [the Chancellor's Ministry] raised concerns about the merits of the carbon capture and storage competition given fiscal constraints' (National Audit Office, 2016, p. 7). In response, several important reports, perhaps most notably 'the Oxburgh report' (Parliamentary Advisory Group on CCS [PAGCCS], 2016) argued an urgent need to reconsider the approach to CCUS development and deployment in the UK. Both the cited reports clearly recognize the need to reconsider the role of CCUS, in line with internationally accepted scientific advice that it is necessary to deliver the type of net zero outcomes that the UK was intending to develop firm targets to meet (IPCC, 2018).

It was the challenge of establishing how a required large scale and costly technological solution can be supported and deployed in a manner that is consistent with the fiscal and economic well-being of the nation that

motivated the new Minister of State for Energy and Clean Growth (in her leadership role of the new BEIS ministry that encompassed the former DECC⁶) to set up the CCTF in 2018. The remit handed to the CCTF was to make recommendations to inform the Government's intended 'CCUS Action Plan' as part of the ongoing development of the UK Industrial Strategy.

In turn, it was this CCTF initiative that BEIS officials asked us to engage with. Our Turner and Race (2016) intervention, explaining our own understanding of the Chancellor's 2015 decision, helped set us up as policy entrepreneurs with the type of balanced perspective required to build consensus in now the case for CCUS may be reconsidered in the UK. This, combined with our expertise in technically informed economy-wide modelling and scenario analyses for a range of decarbonization solutions, and, of course, the initial idea we had set out, motivated the BEIS request for us to develop the narrative, underpinned by a solid evidence base that would be acceptable to HM Treasury and a wider policy stakeholder community.

This is the point at which we took on the role of 'policy entrepreneurs' (Kingdon, 1995). Considering Béland and Cox's (2016) 'Ideas as Coalition Magnets' model, we were implicitly challenged to do two things. First, to appropriate and/or reframe a broad 'polysemic' idea (here focussed on economic/societal outcomes). Second, to gain legitimacy for the idea via engagement with a group of stakeholders/experts (less familiar with such ideas) brought together by a major decision-maker to consider a specific policy prescription. However, here we also draw on Dudley's (2013) arguments regarding the need, while keeping the idea sufficiently ambiguous to appeal across interest groups and permit flexibility in building the coalition, to give it sufficient factual and cognitive content that it anchors to real world events and dynamics.

Preparing to building consensus around our idea: setting out an appealing narrative

BEIS officials informally framed the need for our activity in terms of 'setting out a narrative around which broad consensus may develop' for CCUS in the UK. While setting out a narrative around our sustained contribution idea fell naturally into our field of expertise of technically informed economy-wide impact analysis, the need to build consensus took us into less familiar terrain. Moreover, we are new to the field of using ideas and narratives to build consensus in a manner that ultimately empowers policy-makers to take transformative action. This element of the challenge led us to study the public policy literature to inform our work. We also sought advice from our political science colleagues in the School of Government Policy at the University of Strathclyde, who directed us to a wealth of relevant writings that we drew on in conducting our work, and cite through this essay.

In addition to building our understanding of how to compose and communicate a narrative, a key insight emerging from discussions with our colleagues and writings in policy sciences is how we, as new policy entrepreneurs developing ideas and narratives, need to recognize that ideas are often destabilizing agents, and will be resisted if stakeholders fear that their interests will be affected (Dudley & Richardson, 1996; Richardson, 2000). Recognition of this issue was crucial. Our expectation had been that members of the CCTF – as a group of industry and technology stakeholders directly impacted by and/or concerned with promoting the role of CCUS – would be open to engaging with our idea and narrative on the basis that we ‘talk the same language’ as HM Treasury, the ministry responsible for the fiscal and economic decision making that could ‘make or break’ the case for CCUS in the UK. That is, while the ‘sustained contribution’ idea would not be familiar to them at the outset, we had believed CCTF members would welcome our idea and narrative on the basis of its likely resonance with the policy decision-making hierarchy (including politicians more generally concerned with economic well-being and jobs). Thus, we proceeded with caution in preparing to engage with the CCTF.

Our first step was to develop a non-technical policy brief (Turner et al., 2018) that set out our idea concerning the potential for CCUS (if it can be deployed as a competitive decarbonization solution) to sustain economic value generation, including jobs, in a wide range of sectors across the UK economy. In an attempt to make the narrative appealing in terms of its trustworthiness with economic decision makers in government, we decided to link it to existing government data on industry activity and employment set out as ‘employment multipliers’ (how many jobs are required, via indirect supply chain linkages, across the wider economy per direct job or monetary unit of industry demand).⁷ Multipliers are reported for all UK industries, including the energy supplying and intensive use industries where CCUS activity may take place. They are generated through a simpler, but not inconsistent, method of economy-wide modeling that we (and HM Treasury) more commonly use in applied analysis. The key point is that they constitute a familiar and transparent metric with a broader policy stakeholder community in the UK and, thus, did not over-complicate the idea or narrative we needed to communicate and building consensus around.

In terms of the ‘story’ told, the narrative was articulated around the fact that substantial (public and private) investments have already been made in the industries that need to decarbonize, and that this has enabled significant and continued value generation, including supporting many direct industry and indirect supply chain jobs across the UK economy. We did not limit the articulation of our idea to jobs/employment but did make this the primary

way of framing the narrative. This was motivated by wider political and public concern in the UK over how the (then) low (now zero) carbon transition may impact on both citizens' sources of income, and the associated income tax revenues that are the single largest source of public revenues at national level.⁸ This meant that we were implicitly attempting to set the idea in terms of economic justice through the sustainability (and desired continued growth) of jobs and industry, and how UK citizens and society will ultimately pay for the transition (through a range of price and income changes). It is also consistent with broadening of the earlier idea of 'sustainability' (one of the examples of ideas as coalition magnets considered by Béland & Cox, 2016) to bridge concerns for the environment with support for continued economic growth (e.g., see Adger & Jordan, 2009; Edwards, 2005).

In focussing attention on jobs, we also considered the impact of attaching both positive and negative emotive qualities to our idea. That is, we did set out the potential for competitive decarbonization through investment in and deployment of CCUS to sustain and potentially grow the contribution of high value UK industries. But we also set out the potential for extensive job losses if energy intensive supplying and/or using industries were to relocate from the UK in the absence of competitive decarbonization solutions (including the prospect of overly costly CCUS). We acknowledge that, as argued by Cox and Béland (2013), ideas with strong positive emotional quality, or valence, may have broader appeal and be more productive in building coalitions. We would also associate our 'sustained contribution' idea with Dudley's (2013, p. 1142) argument that effective narratives 'can provide a reassuring perspective of continuity, even amidst major change'. But at the stage of developing, articulating and communicating the idea and narrative, we considered that identifying potential negative valence associated with losing jobs may help articulate the need to consider economic (and social) justice and distributional implications for a wider societal community. We considered that this may be particularly useful in the context of the more technically focussed CCTF audience being less familiar with economic-value arguments, but where, as individual citizens/human beings, they could not help but be aware of media and public debate around job losses when industries decline and/or disappear.

The consultation process

Given the understanding we had gained from the literature as to how our political economy focussed idea and narrative could be destabilizing, we began our consultation in a staged manner. Before the CCTF even began to meet, and throughout the process of drafting the Turner et al. (2018) brief (January-March 2018), we engaged in an iterative process of engagement with BEIS officials and other stakeholders (some but not all of whom would

be directly involved in the CCTF). More generally, we put significant weight on the role of discourse as a coalition-building device (Schmidt, 2008, 2011), both in communicating the idea and building our own influence through using our research record to underpin the idea. We formally submitted the brief to the CCTF when it began to meet in March 2018, following up with a formal presentation and discussion at a steering group meeting in April 2018. The latter was necessary to gain the full attention of CCTF members and ensure their understanding of the narrative and its resonance with policy decision makers. We decided that, of the three of us, Karen Turner should be the one to go in person, given that she has the most extensive expertise on the political economy side of our work, and in engaging with economic and fiscal decision makers. That is, our judgement was that it was crucial the narrative was conveyed, explained and contextualized by the member of our team most familiar with the reasons as to why a 'yes' or 'no' decision may be made on economic and fiscal grounds. Of all the CCTF community present, industry stakeholders responded most positively. Those concerned with developing CCUS technology were clearly more wary but, on balance, the session went well, though it was not clear at that point end whether consensus was secured or the narrative would be reflected in the CCTF recommendations.

We knew that the CCTF would consult more widely in considering their report. Therefore, alongside the process of directly engaging with them, we also engaged and articulated our idea via an EU-level initiative that involved several of the same actors and was led by the Zero Emissions Platform (ZEP, an industry-focussed network set up under the EC European Strategic Energy Plan, or SET-plan, to consider the role of CCUS).⁹ This initiative involved producing a report primarily aimed at European Commission (EC) decision-makers on the potential role of CCUS in delivering on the mid-century ambitions of the Paris Agreement. The Turner et al. (2018) brief informed that work also. In this context, we had more power in influencing the outcome, with Karen Turner invited to co-lead the resulting report. There, our idea was extended, again with illustrative use of employment and GDP multiplier metrics, in the context of a pilot CCUS project at the Port of Rotterdam (the Netherlands) and how this may impact industry both there and, via supply chain linkages, in Germany. This additional engagement may provide an example of how our 'sustained contribution' idea and narrative is applicable and can be transplanted across national boundaries, and into supranational arenas (Dudley & Richardson, 1999). However, the key point for our case study here is that involvement in the ZEP project most likely added to the legitimacy of our idea, and to our role and power to influence the discourse at home by setting our idea in a broader European policy context (particularly with the ZEP report being published within days of the CCTF one).¹⁰

The first tangible outcome: the target community incorporate our idea in their own narrative

The outcome of the CCTF engagement with our idea (and the accompanying narrative) was that the CCTF did in fact use it, and cite the Turner et al. (2018) brief, in setting out a recommendation in their July 2018 report to Government that specifically reflecting it in a distinct recommendation. The headline Recommendation (albeit only ranking at #9 of 16), was worded as follows:

Working with industry, Government to more fully assess value of CCUS to the wider UK economy (including in terms of utilising existing infrastructure, skills capacity, and supporting opportunities for future clean growth and development). CCUS CCTF (2018, p. 10)

The section of the report (CCUS CCTF, p.24) that explains this recommendation cites the factual content (employment multiplier evidence) set out in our brief. On the other hand, the wording of the headline recommendation reflects the more polysemic nature of the idea, highlighting several potential outcome areas that will be valued by actors with various interests and preferences. That is, the CCTF refine our narrative in a way that they feel will speak to their own stakeholder community. For example, the oil and gas industry – which may provide carbon transport and storage services – has interest in implications for infrastructure, while labour organizations are concerned with maintaining skills levels, and environmental interest groups are concerned with clean economic development pathways. While the headline recommendation translates our idea with a heavy positive valence, the fuller text (p.24) cites our brief in the context of setting out the more negative ‘we may lose what we have’ connotation:

‘Failure to deploy CCUS early increases the risk that these jobs and industries disappear from the economy[W]ith the right policy signals from Government, CCUS can help to ensure that the jobs of the skilled workforce are retained’ (CCUS CCTF, 2018, p. 24)

The emerging policy prescription and narrative presented by government

The second, but ultimately key outcome emerges through the response of the BEIS actors within Government, who had requested the development of our ‘sustained contribution’ idea and narrative in the first place. They reflect our idea and narrative in their own policy formulation, which the CCTF was set up to report to.

This outcome takes effect through the publication of the UK Government CCUS Action Plan in November 2018 (BEIS, 2018), which coincided with an ‘Accelerating CCUS’ conference, organized by BEIS with the International

Energy Agency and several other bodies in Edinburgh, Scotland.¹¹ This document (BEIS, 2018, p. 29) sets our idea in the context of a proposition to deploy CCUS in industrial centres (or clusters) as part of the UK Industrial Strategy, and citing both the aforementioned Oxburgh report (PAGCCS, 2016) and the CCUS CCTF (2018) report. That is, while BEIS could have taken our idea directly – and indeed their Action Plan document more directly reflects the wording and content of narrative than the CCTF report does – on one level they set it within the context of emerging through a broader consultative process.

On the other hand, BEIS do directly reflect the narrative that they asked us to develop, with the Turner et al. (2018) brief being directly cited and our language around the ‘sustained contribution’ adopted in the text. They also take the interesting step of explicitly identifying us as policy influencers: on p.16 of the BEIS (2018) Action Plan we are cited as one of the ‘ideas foundations’ of the UK Industrial Strategy, and, within the key on the next page, there is a statement that we conduct ‘world-leading research into the economic impacts of CCUS’ (BEIS, 2018, p. 17). This wording is no doubt intended to further empower BEIS in adopting the ‘sustained contribution’ narrative, through associating it with us as a reputable research and knowledge base.

Again, the way the idea and narrative are communicated by those who have accepted it is interesting. At the point in the text where the idea is articulated, BEIS (2018, p. 29) draw on both the specific language used (e.g., ‘sustained contribution’) and the employment multiplier examples given, as reflected in the following paragraph:

At a local and regional level, direct high value jobs in capital intensive industries, such as oil and gas, chemicals, and other energy intensive industries have been shown to support up to four jobs in indirect employment (Turner et al., 2018). Decarbonising these industries, potentially through deployment of CCUS, allows their sustained contribution to economic growth both nationally and in the regions in which the industry is concentrated. This is a key reason why CCUS is being progressed in other European industrial centres such as the Port of Rotterdam. Furthermore, skills and supply chains from the oil and gas and chemicals industries could transition to service a growing CCUS industry, allowing the retention and creation of further high value jobs. (BEIS, 2018, p. 29)

There are a couple of particularly interesting features of how the idea is articulated as a policy proposition here. First, while the coalition scale that the UK Government was aiming at is national one, the international context is emphasized in the reference to Rotterdam. This could be motivated by the need to gain legitimacy for UK action in a global economy setting. Another potential motivation for the specific mention of Rotterdam may be the potential to lose ‘early mover’ and competitive advantage in proceeding with decarbonization activity in a global economy context (i.e., giving the impression that Rotterdam is already doing it).

The second interesting feature is that what we intended as basic illustrative examples of evidence through presentation of ‘employment multiplier’ data in the Turner et al. (2018) brief is again (as in the CCTF report) cited as more explicit evidence (‘up to four jobs in indirect employment’). This may simply be reflective of a perceived need to show that propositions are underpinned by knowledge of the nature and number of jobs concerned, and/or of the scale of the challenge being addressed. On the other hand, particularly given that (as noted above) BEIS used the language of ‘narrative’ development at the outset of the process outlined here, it may be suggestive of the UK Government attempting to move beyond the more polysemic and positive valence idea of potential economic benefits to develop a narrative to underpin specific policy action.

In this context, we consider the Narrative Policy Framework (NPF) proposition of Jones and McBeth (2010) that is further developed and debated in (Gottlieb et al., 2018; Jones & Radaelli, 2015; Peterson & Jones, 2016). A key feature of the NPF is that it requires a clear epistemology including the standards used to establish the accuracy and ‘truth’ of conjectures, perceptions and findings, and has a set of elements in terms of the setting, characters, plot and ‘moral of the story’ (Jones & Radaelli, 2015). In this type of setting, it has been argued (e.g., by Janda & Topouzi, 2015) that energy policy narratives, generally being technology focussed, lack human characters (victims, villains and heroes) to build a story around. But here, if indeed a narrative is being developed, the use of our idea around economic sustainability enables BEIS (2018) to set out a story that aligns with the elements of the NPF. That is, the setting is the need for industries to decarbonize. Characters can be identified in terms of potential victims (workers and their jobs), a villain (the risk of decisions being taken on decarbonization actions that harm industry competitiveness relative to the Rotterdam case), and a hero in the form of government/industry collaboration in developing a competitive CCUS infrastructure to service UK industry clusters. In terms of the plot-line and ‘moral of the story’, this would require scenario analysis for potential pathways to introducing CCUS in an industry cluster context, which in turn adds to the need to develop an evidence base.

Conclusion: what lessons have we learned?

So what can we learn from the case example set out above around our role as academic policy entrepreneurs in the context of advancing discussions on the development of a CCUS policy proposition in the UK? Our crucial starting point was that we approached Government officials (BEIS) who were challenged to progress an area of climate policy decision making that is likely to require some form of public support in a political economy environment. This set the stage for them to invite us to set out an idea and narrative that has both broad/polysemic features and a solid factual basis that links to the

current dynamic policy context. They worked with us on the refinement of the narrative and directed us to a community with whom they needed to build consensus around a shift in framing and focus of policy on CCUS.

Our idea reflected the political economy concerns of another set of policy decision makers (HM Treasury) who had been responsible for the halt of previous CCUS policy action. It did so by focussing on the need for a 'sustained contribution' to the UK economy from (what are currently) our energy supplying and intensive-use industries (and their respective supply chains) throughout the dynamic process of system level change demanded by the UK's mid-century net zero ambitions. Thus, our idea speaks to the need for a policy solution that can both meet its central aim, decarbonization, while also delivering outcomes that line up the wider UK industrial policy and the need to prioritize sustained fiscal and economic performance.

This is not necessarily a new idea to those concerned with industrial strategy development, public finance or economic policy. But it was less familiar to the community of experts and stakeholders assembled (in the form of the CCUS CCTF) by a major decision maker (the responsible Government minister) to consider a specific policy prescription (on investment and deployment of CCUS) and with whom we were attempting to build a consensus. The main obstacle we anticipated was that our politically economy focussed idea, and our entry (with two of us being economists) into the process of policy formulation in an area that had previously been technology and project cost focussed, would be seen as unseating or taking priority over the stakeholder community's own interests. However, this was less of an obstacle than we feared and the acceptance of our idea was more straightforward and more successful than we anticipated.

In the end, we did gain legitimacy for our 'sustainable contribution' idea through a consensus building process. That a coalition did form in the CCTF community around our idea is evidenced by how it is reflected in one of the recommendations made to Government by that community (via the CCUS CCTF, 2018, report). The outcome was that the support of the coalition then empowered Government officials to reflect the idea in a policy proposal (the BEIS, 2018, 'CCUS Action Plan) for the deployment of CCUS in industrial clusters.

One perspective we could take on the outcome at the interim stage of the CCTF report is that this community were already operating in the context of a recent change in the institutional structure of UK Government (i.e., CCUS, along with other areas of climate policy sit within the new cross-cutting BEIS ministry), and had been through the experience of having their interests set aside in the fiscal budgetary process that previously halted policy action on CCUS. Thus, we may conclude that they no doubt recognized a benefit in listening to and adopting – at least to an extent that they perceived as useful to their own ends – an idea and narrative proposed by us as experts who 'speak the same language' as those who hold decision making power.

On the other hand, the process and outcome could be reinterpreted in a way that suggests we never really faced a serious obstacle in gaining legitimacy and building support for our idea. The initial challenge was not one of persuading a community (the CCTF) to support a policy proposal (investment and deployment of CCUS) that they were in any way averse to (most of the CCTF community were supporters of CCUS). Rather, the challenge was to get them to agree on a new and unfamiliar (to them) way of thinking about the proposal. Those involved in the CCTF arguably still did not hold any real interest in considering the wider economic outcomes that may emerge from CCUS, and retained an interest only in making CCUS happen for technical reasons. Rather, their engagement with and adoption of our idea possibly only happened because it was clear to the CCTF that those in the policy decision-making hierarchy value it.

This may also be part of the reason that the negative valence (risk of job losses if appropriate action is not taken) that we built into the idea alongside the positive valence (enabling jobs to sustain and grow if effective action is taken) was attractive to the CCTF. The language of the CCTF recommendation clearly aimed to highlight the wider economic risk of *not* considering CCUS as part of the portfolio of measures required to meet ambitious climate change targets. On the other hand, this negative valence is immediately set in the positive context of the UK gaining international competitive advantage, if Government ‘sends the right policy signals’. In this context, the CCTF also responded to our illustrative evidence (which originated from Government’s own statistical reporting) set out in our brief in a form trusted by UK policy decision makers (the employment multipliers), and cited it in their own reporting. On the other hand, when Government articulated the idea at the stage of policy proposal (via the BEIS, 2018, CCUS Action Plan) the positive valence/reassuring perspective of our idea was much more heavily emphasized.

What is clear is that the immediate policy audience, and instigators of the coalition building process (BEIS), once empowered by the CCTF recommendation, more directly used our interpretation of the underpinning evidence in setting out their policy prescription (in the BEIS, 2018, CCUS Action Plan). The key characteristic of BEIS as policy actors in this process was that they understood and accepted our idea from the outset and instigated our role as policy entrepreneurs to build legitimacy and support for it. This was clearly to the end of empowering them to develop the narrative that they ultimately put forward in their policy document.

Thus, perhaps the key lesson emerging is the need for academic policy entrepreneurs to identify, directly approach and effectively engage the policy decision-makers with the greatest stake in listening to what we have to say. Impacting policy decision-making and/or advancing policy discourse through building consensus around the ideas we generate from our research is not necessarily a linear process that ultimately takes us from our research

base, through dissemination and engagement to the policy outcome. Rather, in our experience, the key to gaining impact for academic research that can support policy processes is to understand what the desired end point of the process is for policy decision makers. With this foundation we can determine the role that our knowledge and input can play – crucially considering the extent to which simplifying written material and analyses may be more effective than original academic outputs – and identify the collaborators, and wider policy science knowledge base, that can support us in playing a productive role in advancing policy discussions and outcomes.

Notes

1. The UK Government's net zero carbon announcement can be read at <https://www.gov.uk/government/news/uk-becomes-first-major-economy-to-pass-net-zero-emissions-law>.
2. See <https://www.parliament.uk/business/committees/committees-a-z/commons-select/business-energy-industrial-strategy/news-parliament-2017/citizens-assembly-climate-change-19-20/>.
3. Information on our own research programme can be found at <https://www.strath.ac.uk/humanities/centreforenergypolicy/>.
4. See information on the CCUS CCTF at <https://www.gov.uk/government/groups/ccus-cost-challenge-taskforce>.
5. The progress of CCUS in the UK can be tracked on line, including an item on the 2015 cancellation of the CCS Commercialisation Competition, at the periodically updated UK Government website, <https://www.gov.uk/guidance/uk-carbon-capture-and-storage-government-funding-and-support>.
6. See <https://www.gov.uk/government/organisations/department-for-business-innovation-skills>.
7. Employment multiplier data for all UK industries are produced by the UK Office for National Statistics (ONS) for BEIS. They are publicly available at <https://www.ons.gov.uk/economy/nationalaccounts/supplyandusables/adhocs/009746typeiukemploymentmultipliersandeffectsreferenceyear2015>.
8. See <https://www.gov.uk/government/organisations/hm-revenue-customs/about/statistics>
9. Information on the EC SET-plan can be found at <https://setis.ec.europa.eu/setis-reports/setis-magazine/carbon-capture-utilisation-and-storage/set-plan-update>. Information on ZEP can be found at <http://www.zeroemissionsplatform.eu/>.
10. The ZEP report can be found at <https://zeroemissionsplatform.eu/role-of-ccus-in-a-below-2-degrees-scenario/>.
11. Information on the Accelerating CCUS conference can be found at <https://ccuglobalconference.com/files/CCUS-Conference-Programme.pdf>

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