



Perspective

Why support for net-zero technologies can be politically vulnerable: Evidence from Celtic Sea floating offshore wind

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ABSTRACT

Support for net-zero technologies can be broad yet remain politically vulnerable. Actors may converge on the same technology through distinct problem diagnoses without forming a resilient coalition. This Perspectives article examines this proposition through Celtic Sea floating offshore wind (FLOW), a less mature and more expensive technology than fixed-foundation offshore wind. It draws on 68 interviews conducted primarily in 2024 with actors involved in or adjacent to FLOW development. Because opponents and affected publics were not interviewed, the interview material provides an ex-ante baseline rather than a reconstruction of contestation. This baseline is interpreted retrospectively through Hajer's discourse-coalition framework, supported by Ford and Newell's account of regime accommodation and Jasanoff and Kim's socio-technical imaginaries. The analysis identifies four problems for which FLOW was presented as an appropriate response: limitations of existing technologies and deployment geographies in delivering net-zero electricity at scale; vulnerability arising from fossil-fuel dependence and geographic concentration; industrial decline and uneven regional development; and the risk of losing commercial position in an emerging global market. Although these diagnoses differed, each made FLOW appear appropriate, creating an emerging FLOW-supportive discursive alignment rather than a consolidated discourse coalition. This discursive breadth created political flexibility, but not automatic resilience. Read ex post, the alignment appears vulnerable where storylines remain weakly institutionalised or promised regional and industrial benefits fail to materialise. By distinguishing discursive breadth from political resilience, the paper explains why support for costly emerging transition technologies can appear broad before contestation yet remain vulnerable as political conditions harden.

1. Introduction

Floating offshore wind (FLOW) is increasingly presented as an important next-stage technology in electricity decarbonisation. Unlike fixed-foundation offshore wind, where turbines are mounted on structures fixed to the seabed, FLOW uses floating platforms held in place by mooring systems and can therefore access deeper-water offshore wind resources beyond the practical limits of established technologies. This matters because a large share of offshore wind resource lies in waters where fixed-foundation deployment is unsuitable. Yet FLOW remains commercially immature and more expensive than fixed-foundation offshore wind, as it has less settled platform designs, delivery models and supply-chain requirements [1,2]. Its regional and industrial benefits are also not yet secured: claims around jobs, port redevelopment, supply-chain formation and domestic value capture depend on future procurement choices, enabling infrastructure investment, supply-chain

capability and policy support. These features make FLOW a useful case for examining how support forms around an emerging low-carbon technology whose costs, delivery arrangements and wider public benefits remain unsettled.

A principal attraction of FLOW therefore lies in the way it extends the deployment geography of offshore wind. This is especially important in the Celtic Sea, where deeper waters make established fixed-foundation deployment mostly unsuitable, while direct exposure to North Atlantic weather systems gives this oceanic region a distinct offshore wind-resource geography compared with the North Sea, where most of the UK's offshore wind deployment is currently located. Celtic Sea FLOW is therefore not simply an extension of existing offshore wind deployment. It widens the spatial basis of UK offshore wind development beyond areas suitable for fixed-foundation technologies and beyond generation currently concentrated in the North Sea [3–5]. This geographical claim matters for the paper because it shows how FLOW can be framed as a

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response to a specific problem within offshore wind expansion: accessing low-carbon electricity resource in places where established technologies are less suitable (Fig. 1).

Yet FLOW is also contestable. Beyond cost and technological immaturity, it faces environmental uncertainty, infrastructure constraints, port and grid-readiness challenges, supply-chain bottlenecks, skills shortages, operational and maintenance complexity, and unresolved tensions between least-cost procurement and domestic value capture [6,7]. It may also intensify spatial conflicts with fishing, navigation, environmental protection, defence interests and other marine users competing for access to increasingly crowded sea space [8]. These challenges matter because they create openings for alternative problem-solution narratives. FLOW can be framed as necessary for net-zero delivery, energy security and regional renewal, but it can also be reframed as costly, spatially disruptive, environmentally uncertain or insufficiently beneficial to local and domestic economies. Its political vulnerability therefore lies not only in opposition to net-zero itself, but in whether the wider claims made for FLOW become credible enough to withstand competing interpretations.

These technical and political issues are particularly significant in the Celtic Sea because FLOW has been tied to a more regionally specific account of what the energy transition should deliver. The UK Government's commitment to clean power and net-zero targets gives offshore wind a strong national policy rationale [6]. But in Wales and Southwest England, the case for FLOW has also been linked to a regional-development problem: how coastal and post-industrial places shaped by industrial decline and uneven development can participate visibly in new clean-energy activity [9,10]. In this problem-solution narrative, FLOW is presented not only as a source of decarbonised electricity, but as a potential route to port redevelopment, supply-chain formation, regional employment, industrial capability and domestic value capture. Celtic Sea FLOW can therefore be understood as part of a broader socio-technical imaginary of regional renewal, in which a deep-water offshore wind technology is connected to future economic participation in Wales and Southwest England [11,12].

This paper examines how support for Celtic Sea FLOW was articulated among actors involved in, enabling, advising, analysing or

interpreting its development before net-zero and offshore-wind politics became more openly contested during 2025 in the UK and internationally [13–15]. The sample is therefore not designed to represent all affected publics, opponents or marine users. Rather, it analyses an emerging FLOW-supportive discursive alignment among actors situated within or adjacent to the developing FLOW delivery system. The analysis draws on 68 semi-structured stakeholder interviews conducted primarily between May and December 2024, with one further interview in February 2025. These interviews provide a pre-contestation baseline: a record of how FLOW was constructed as necessary, appropriate and worth supporting before a harder political context emerged. They are not used as a measure of later opposition to FLOW, nor as a representation of stakeholder opinion after contestation intensified.

The paper asks: *How did actors involved in or adjacent to Celtic Sea FLOW construct problem-solution storylines and what do their distribution and co-occurrence reveal about discursive alignment?*

A secondary question follows from this: *What does this pre-contestation baseline reveal about the breadth and vulnerability of support for emerging low-carbon technologies whose costs, delivery pathways and promised public benefits remain uncertain?*

To answer these questions, the paper uses Hajer's discourse coalition framework [16,17] as its main conceptual anchor. In this framework, storylines are condensed problem-solution narratives that define what the problem is, why it matters and what kinds of intervention appear necessary or appropriate. This is useful for analysing Celtic Sea FLOW because the interviews do not reveal a single shared rationale for support. Instead, they show how FLOW was made meaningful through several overlapping problem-solution narratives: as a response to net-zero electricity delivery, energy-security vulnerability, regional economic renewal and emerging industrial opportunity. The paper therefore analyses not a formal coalition with fixed membership, but an emerging FLOW-supportive discursive alignment reproduced by actors occupying different institutional and system positions. It also draws on work on regime accommodation [18] and socio-technical imaginaries [11,12] to explain how FLOW was translated into familiar political-economic narratives of security, growth, jobs, competitiveness and regional renewal.



Fig. 1. UK coastal waters and relevant offshore wind geographies. (Source: Authors).

The central observation is that support for Celtic Sea FLOW was assembled through overlapping problem-solution storylines rather than through consensus around a single rationale. Within the net-zero policy frame, FLOW was constructed as a response to the challenge of delivering low-carbon electricity at sufficient scale and across wider geographies. Within the energy-security frame, it was constructed as a response to fossil-fuel dependence, price volatility and geographic concentration in the electricity system. Within the regional-development and commercial-opportunity frames, it was constructed as a route to port redevelopment, supply-chain formation, industrial value capture and future market positioning. These storylines broadened the case for FLOW by connecting it to multiple public purposes, but they did not necessarily form a fully consolidated or institutionally embedded coalition.

The paper's contribution is to show how support for an emerging low-carbon technology can be assembled when different problem-solution storylines are made compatible across actors, while remaining vulnerable where that alignment is weakly institutionalised or where promised benefits are not materially delivered. In the Celtic Sea case, actors constructed FLOW as an appropriate response to distinct problems: delivering low-carbon electricity at scale, reducing energy-security vulnerability, addressing uneven regional development, and securing industrial and commercial opportunity. Their accounts converged on FLOW without requiring a single overarching diagnosis. This breadth created political flexibility, but not automatic resilience. The same storylines that widened the case for FLOW also created expectations around delivery, value capture and regional renewal that could become sources of vulnerability under harder political conditions.

2. Theoretical framing: discourse coalition analysis, regime accommodation and socio-technical imaginaries

Support for emerging low-carbon technologies is not secured through technical feasibility alone. Technologies also have to be made meaningful within wider political, economic and institutional contexts. This is especially important where technologies remain costly, immature or dependent on future benefits that are not yet visible [19]. In such cases, support depends partly on how actors construct the problems to which the technology is presented as a necessary response, how that response connects to existing policy priorities, and how its promised benefits connect to existing policy priorities and imagined futures.

This paper analyses these problem constructions through Hajer's discourse-coalitional framework. Storylines condense complex issues into accessible narratives that define what a problem is, why it matters, and what kinds of action are appropriate. Broad policy categories such as net-zero, energy security, and regional development are therefore not automatically storylines in themselves. They become storylines when actors connect a particular diagnosis of a problem to a corresponding course of action or technological solution. Storylines are consequently part of the discursive work through which technologies become politically meaningful and institutionally supportable [16,17].

Hajer's framework is useful here because it explains how actors occupying different institutional positions may align discursively without sharing identical interests or values. A discourse coalition is not a formal alliance or membership organisation, but an ensemble of actors who reproduce shared sets of storylines through related practices [16,17]. Common support for a technology is therefore not, by itself, sufficient evidence of a single discourse coalition. Because the interviews capture the accounts of actors situated within or adjacent to the developing FLOW delivery system, rather than the full range of practices and contesting actors around FLOW, the framework is used here as an analytical heuristic rather than to claim the definitive reconstruction of a coalition. The analysis examines which institutional and system positions reproduced particular storylines, how those storylines co-occurred, and the extent to which these patterns indicate an emerging FLOW-supportive discursive alignment.

For Celtic Sea FLOW, this shifts attention from whether actors shared a single motivation to how they constructed different problems for which FLOW appeared to offer an appropriate solution. Within the net zero policy frame, FLOW was presented as a response to the limits of established technologies and deployment geographies in delivering low-carbon electricity at sufficient scale. An energy-security storyline framed fossil-fuel dependence, price volatility and the geographic concentration of generation as vulnerabilities to be addressed through domestic and geographically diversified offshore supply. A regional-development storyline framed industrial decline and uneven development as problems that FLOW could help address through port redevelopment, employment, supply-chain formation and industrial value capture. A commercial-opportunity storyline framed deeper-water wind resources and an emerging international market as opportunities to build capability and secure future market position. These storylines converged on FLOW as a technological solution without necessarily constituting a single discourse coalition.

This makes the degree to which a discursive alignment becomes structured and institutionalised analytically important. Hajer distinguishes discourse structuration, where the terms of a discourse increasingly shape how actors conceptualise a policy problem, from discourse institutionalisation, where that discourse becomes embedded in institutional arrangements and practices [16,17]. These concepts provide theoretical criteria for interpreting the potential resilience of FLOW support rather than outcomes directly measured by the interviews. Storyline breadth can create political flexibility by allowing actors with different problem constructions to converge on the same technological solution. However, that alignment becomes more resilient only where it extends beyond discursive compatibility into sufficiently stable policy commitments, procurement arrangements, infrastructure investment and delivery practices. Vulnerability therefore arises not simply because one storyline weakens, but where the broader alignment remains weakly institutionalised or its promised benefits fail to acquire material credibility (become more than aspirational rhetoric through physical outcomes – procurement decisions taken, infrastructure built, delivery under way).

This connects to work on regime resistance and accommodation in energy transitions. Ford and Newell's neoGramscian perspective draws attention to how incumbent political-economic orders may not only resist transition pressures but also accommodate selected low-carbon technologies by translating them into established priorities of growth, competitiveness, security and development [18]. From this perspective, these narratives do more than provide additional reasons for supporting FLOW. They construct policy problems in terms already legible within the prevailing political-economic order and present FLOW as a compatible solution. FLOW could therefore be made meaningful as a means of securing domestic energy supply, building industrial capability, creating regional employment, strengthening supply chains and positioning the UK within an emerging global market. The interviews do not establish that this translation was strategically coordinated; rather, they show how these familiar political-economic priorities were reproduced across respondents' accounts.

A final supporting concept is Jasanoff and Kim's idea of socio-technical imaginaries: collectively held and institutionally stabilised visions of desirable futures made attainable through science and technology [11,12]. This concept helps interpret the regional significance attached to Celtic Sea FLOW. Within respondents' accounts, FLOW was associated not only with low-carbon electricity generation, but with an imagined future of port redevelopment, supply-chain formation, regional employment, industrial renewal and clean-energy capability in Wales and Southwest England. The paper treats this as a regional-renewal imaginary articulated among FLOW-involved and FLOW-adjacent actors, rather than as evidence of a vision shared by all affected publics. Its credibility depends on whether promised benefits become stabilised through procurement, infrastructure investment, supply-chain development and visible economic participation. If these

arrangements and benefits fail to materialise, the gap between the imagined future and experienced delivery may allow competing storylines to reinterpret FLOW as an expensive technology that has not produced the promised regional transformation.

Taken together, these concepts provide a layered but bounded analytical framework. Hajer's discourse coalition framework is used heuristically to identify the problem-solution storylines reproduced by different actor groupings; examine how those storylines co-occurred and assess the extent of discursive alignment around FLOW without presuming a consolidated coalition. Regime accommodation helps explain how FLOW was translated into familiar political-economic priorities of security, growth, jobs and competitiveness. Socio-technical imaginaries illuminate how FLOW became connected to a desirable future of industrial renewal. The empirical analysis therefore examines how these processes contributed to an emerging FLOW-supportive discursive alignment, while using structuration, institutionalisation and materialisation to theorise the conditions under which such an alignment may become resilient or vulnerable rather than treating them as outcomes directly measured by the interviews.

3. Empirical basis, interview design and analytical approach

This study draws on 68 semi-structured stakeholder interviews conducted between May 2024 and February 2025 in the context of Celtic Sea floating offshore wind. The interviews were undertaken as part of a wider qualitative study of the Celtic Sea FLOW innovation system but were not originally designed as a discourse-coalition study. This paper retrospectively re-analyses the relevant interview material using Hajer's framework as an analytical heuristic to examine problem-solution storylines through which FLOW was made meaningful as a policy and technical response. The sample was not designed to represent all affected publics, opponents or marine users. Its purpose is narrower: to examine an emerging FLOW-supportive discursive alignment among actors involved in, enabling, advising, analysing or interpreting Celtic Sea FLOW development.

This scope is central to the paper's contribution. The interviews are not used to measure the later negative turn in net-zero or offshore-wind discourse. Rather, they provide an ex-ante baseline – from before contestation intensified in 2025 – of supportive and FLOW-adjacent storylines that can now be interpreted ex post, after the political context became more contested. This makes the data valuable for identifying how support was assembled through different problem-solution storylines; how those storylines were distributed and combined across actors; and the conditions under which this emerging alignment might later prove vulnerable.

All participants were asked the same opening question: What factor (s) do you think are the principal motivations behind the growth of offshore wind and/or FLOW technologies in the Celtic Sea – and why? The reference to “motivations” reflects the original innovation-system research design; the present analysis re-examines the explanatory accounts respondents gave when answering this question rather than treating the motivational categories themselves as storylines.

The framing categories were developed iteratively. Early interviews were used to identify candidate motivations inductively from respondents' own accounts. These were then incorporated into an evolving discussion prompt for later interviews. As the list developed, it was shared with subsequent interviewees, who were invited to reflect on the themes already identified, identify gaps, add further motivations and reprioritise the list in light of their own understanding of FLOW. This design retained the open-ended initial question while improving comparability, but it also meant that later interviews combined spontaneous accounts with discussion prompted by categories already identified. The four storylines used in this paper are therefore not presented as wholly inductive findings; Hajer's framework is applied retrospectively to interpret the problem constructions and proposed solutions expressed within and across these elicited domains. Because

later interviewees were presented with themes identified in earlier interviews, we cannot establish whether the same four storylines, or the same relative emphasis among them, would have emerged without those prompts.

The final prompt list comprised seven themes: achieving net zero; achieving energy security; supporting national economic development; supporting the commerciality of large energy-intensive industries; supporting regional economic development and creating jobs; creating commercial leadership in an important new industry; and exploiting and leveraging a natural resource as a commercial opportunity. For the present analysis, these themes were treated as elicitation domains rather than as storylines in themselves. Respondents' explanations within and across the domains were re-examined to identify how problems were constructed and how FLOW was positioned as an appropriate response. The resulting analysis was organised around four recurring problem-solution storylines: net zero electricity delivery and deployment geography; energy security vulnerability and system resilience; regional economic renewal and industrial value capture; and competitive advantage and commercial opportunity (Table 1).

Responses were re-examined as problem-solution accounts rather than treated as evidence of a single underlying driver. The analysis considered how respondents constructed the relevant problem, why it mattered and how FLOW was positioned as an appropriate response. To support comparison while preserving anonymity, each interview was assigned two descriptors: broad institutional grouping and system position. The full set of institutional groupings and specific areas of expertise for all 68 respondents is provided in Appendix A. Responses were then coded for lead and supporting storylines and for patterns of storyline co-occurrence. This enabled comparison of how the four storylines were distributed and combined across actors occupying different positions in the emerging FLOW system. Storyline co-occurrence was not treated as proof of a consolidated discourse coalition, but as evidence for assessing the extent and character of an emerging FLOW-supportive discursive alignment within the sampled field.

The sample comprised engineering and technical-advisory actors (22), supply-chain actors (16), government-institution respondents (10), developers and owners (8), applied researchers (6), and market-and-discourse actors (6). Appendix A provides respondent-level institutional profiles and expertise, while Appendix B visualises the breadth of institutional and functional representation. Organisational and individual identities are withheld to preserve participant anonymity.

4. Problem-solution storylines for Celtic Sea FLOW

The ex-ante baseline shows that support for Celtic Sea FLOW was articulated through a layered repertoire of problem-solution storylines rather than through a single shared rationale. Within the net-zero policy frame, the challenge of delivering low-carbon electricity at sufficient scale and across wider deployment geographies appeared most often as the lead storyline, but respondents rarely relied on this alone. It was frequently combined with storylines framing FLOW as a response to energy-security vulnerability; industrial decline and uneven regional development; and the risk of losing industrial and commercial opportunities in an emerging market. This broader justificatory repertoire matters particularly for FLOW because, as a newer, less mature and more expensive technology than fixed-foundation offshore wind, its development depends on a wider set of public, economic and strategic claims.

4.1. Net zero electricity delivery and deployment geography

Within the net-zero policy frame, respondents characterised the challenge of delivering low-carbon electricity in terms of scale, seabed access and geographic reach. Many emphasised FLOW as necessary because fixed-foundation offshore wind alone could not access the range of sites presented as required for long-run electricity-system

Table 1
Interview-prompt domains and retrospective problem-solution analysis.

Interview-prompt item(s)	Analytical storyline	Problem construction	FLOW presented as a response
Achieving net zero	Net-zero electricity delivery and deployment geography	Established fixed-foundation offshore-wind technologies and deployment geographies do not provide access to the full range of resources presented as necessary for long-term low-carbon electricity delivery.	FLOW opens deeper-water resources and widens the geography available for offshore-wind deployment.
Achieving energy security	Energy-security vulnerability and system resilience	Dependence on imported fossil fuels, exposure to price volatility and the geographic concentration of generation create energy-system vulnerabilities.	FLOW expands domestic renewable generation and supports geographic diversification of offshore electricity supply.
Supporting national economic development; supporting the commerciality of large energy-intensive industries; supporting regional economic development and creating jobs	Regional economic renewal and industrial value capture	Industrial decline, uneven regional development and limited domestic capture of offshore-wind value constrain regional and national economic participation in the transition.	FLOW offers potential port redevelopment, employment, supply-chain formation, industrial capability and domestic value capture.
Creating commercial leadership in an important new industry; exploiting and leveraging a natural resource as a commercial opportunity	Competitive advantage and commercial opportunity	Deeper-water wind resources and an emerging international industry create an opportunity that may be lost if capability and market positions develop elsewhere.	FLOW enables resource exploitation, early capability formation and positioning within a future international market.

Note: The prompt items were used as elicitation domains rather than as storyline codes. The table presents the principal retrospective synthesis of problem constructions expressed within and across those domains; individual responses could contribute to more than one storyline.

decarbonisation. R51 described offshore wind as “the only realistic path to net-zero” in electricity generation and argued that floating becomes necessary as shallow-water opportunities narrow. R57 similarly presented climate action as “always going to be the big part of it,” while R44 treated net-zero as the central driver even when also acknowledging security and industrial considerations. R28 likewise said he would “make the net-zero argument” first.

What matters analytically is that net-zero provided the overarching policy frame, while the storyline connected a particular electricity-delivery problem to FLOW as its technological response. Even respondents who foregrounded decarbonisation tended to fold in wider claims about resilience, economic value or industrial opportunity. For a technology that still faces greater cost scrutiny and delivery uncertainty than fixed-foundation offshore wind, FLOW was made relevant not simply because climate policy required additional low-carbon generation, but because it could access deeper-water resources and widen the

geography of offshore deployment. The co-occurrence of this storyline with other problem constructions broadened the emerging FLOW-supportive alignment without necessarily making those other storylines extensions of the net-zero rationale.

4.2. Energy security vulnerability and system resilience

The second major storyline characterised energy-system vulnerability around dependence on imported fuels, exposure to fossil-price volatility and concentration risk within the existing generation mix. Offshore wind and FLOW were presented as domestic energy resources capable of reducing these vulnerabilities. In several interviews, this storyline rivalled or overtook net-zero electricity rationale. R54 placed energy security first and linked it to diversifying offshore generation beyond the North Sea. R37 similarly described energy security as the primary driver after the gas shock and wider hydrocarbon volatility following Russia's invasion of Ukraine, while R24 treated offshore wind as predominantly about security of supply and consumer cost.

The construction of energy-security vulnerability was spatial as well as geopolitical. Respondents stressed the value of geographic diversification across the North Sea, Scotland and the Celtic Sea, both to access deeper-water resource and to build a more resilient offshore generation portfolio. R44 treated security largely in these system-resilience terms, while R59 similarly emphasised spreading generation across basins rather than concentrating too heavily in one part of the offshore system.

For FLOW, this storyline translated a relatively expensive and less mature technology into a more immediate problem-solution account centred on domestic supply and system resilience. Importantly, it did not depend on the net-zero policy frame in every interview: respondents who placed security first constructed fossil-fuel exposure and geographic concentration as problems to which FLOW offered a distinct response. Nevertheless, the security and net-zero electricity storylines frequently co-occurred because domestic and geographically diversified generation could serve both purposes. Their co-occurrence therefore contributed to an emerging FLOW-supportive alignment without reducing energy security to a supporting extension of the net-zero rationale.

4.3. Regional economic renewal and industrial value capture

The third storyline characterised industrial decline, uneven regional development and limited domestic value capture as problems to which Celtic Sea FLOW offered a potential response. This is where the regional specificity of the Celtic Sea case becomes especially important. Many respondents did not present FLOW simply as an electricity technology. They framed it as a route to jobs, fabrication, ports, supply chains and industrial renewal in coastal and economically weaker regions.

R55 was particularly clear that, for government, the “ultimate root” motivation was national economic development: building a domestic industrial base, creating jobs and investment in coastal regions, and positioning the country in a growing global industry. R34 similarly emphasised the growing policy weight attached to regional and national value capture, especially while floating supply chains are still being formed. R57 linked FLOW to supply-chain creation and employment, particularly regional jobs, while R28 argued that floating offers a stronger opportunity than fixed-foundation offshore wind to capture manufacturing, assembly, products and services in the UK.

At the same time, respondents were clear that value capture is not automatic. R44 warned that the UK's fixed-foundation experience showed how easily industrial value can leak overseas if domestic capacity is not in place. R59 supported FLOW as an economic strategy but questioned whether the UK still had the heavy industrial base required to capture all available manufacturing value. R18 likewise treated domestic value as desirable, but conditional on realistic delivery choices and wider strategic alignment.

This storyline is important because it shows how FLOW was

connected to a regional-renewal imaginary extending beyond electricity decarbonisation alone. As a costlier and earlier-stage technology, FLOW drew support from its promise of visible territorial and industrial benefits. That promise broadened the emerging discursive alignment, but it also created a test of institutional and material credibility. If jobs, ports and supply chains formed part of the case for FLOW, then pathways to their delivery through procurement, infrastructure investment and domestic capability had to become more than aspirational rhetoric.

4.4. Competitive advantage and commercial opportunity

The fourth storyline characterised deeper-water wind resources and the emergence of an international FLOW industry as a strategic and commercial opportunity that could be lost if capability and market positions developed elsewhere. This storyline was less universal than the net-zero electricity account, but remained important because it positioned FLOW as a strategic opportunity rather than only a public obligation. For some respondents, the case for FLOW rested partly on the chance to lead in an emerging industry and to exploit a strong offshore-wind resource before market positions hardened.

R66 placed commercial leadership at the centre of the Celtic Sea narrative, linking it to both first-mover advantage and the longer-standing rationale of leveraging a natural resource. R28 similarly emphasised that floating is a more nascent industry than fixed-foundation offshore wind and therefore offers the UK a better chance to secure a strong global position. R59 also framed floating wind through a resource logic: once good shallow-water sites are constrained, the industry has to “chase the resource” into deeper waters.

Several respondents made the FLOW-specific point that deeper-water resource access was not just a technical detail, but central to this problem-solution narrative. In this account, FLOW was justified not because it is currently cheaper than fixed-foundation offshore wind, but because it opens otherwise inaccessible areas of deployment and may allow the UK and its regions an opportunity to build capability in a sector expected to grow internationally. This gave the commercial-opportunity storyline a future-oriented quality: FLOW was presented as a response to the risk of missing an opportunity for resource development, strategic relevance, and potential leadership in an emerging global market.

4.5. Storyline co-occurrence and emerging discursive alignment

Taken together, these four storylines suggest that support for Celtic Sea FLOW developed through convergence on a common technological response rather than consensus around a single problem definition. Respondents did not converge on one overriding rationale. Instead, different problem constructions allowed actors to recognise their own priorities within a broader case for deployment. This convergence indicates discursive affinity among the sampled actors but does not by itself demonstrate the existence of a consolidated discourse coalition.

The distribution of storylines varied across institutional and system positions, although none was exclusive to a particular actor group. Government-institution respondents tended to connect net-zero electricity delivery to national and regional economic development and domestic value capture. Developer/owner respondents more often combined deployment geography and resource access with questions of commercial viability and future market opportunity. Supply-chain respondents placed greater emphasis on domestic capability, employment, regional value capture and commercial leadership, while frequently also invoking net zero or energy security. Engineering and technical-advisory respondents most consistently foregrounded questions of technical scale, water depth, resource access and geographic diversification, often connecting these to electricity delivery or system resilience. Applied-research respondents and market-and-discourse actors commonly articulated broader combinations across climate, security, regional and commercial problems. These tendencies overlapped

substantially: no actor grouping reproduced only one storyline, and no storyline belonged to only one grouping (Table 2).

Across these and other interviews, three combinations appear especially important. First, the net-zero electricity and energy-security storylines connected long-horizon decarbonisation to more immediate concerns about resilience, domestic supply and reduced exposure to hydrocarbon volatility. Second, the net-zero electricity and regional-renewal storylines widened the case for FLOW by linking long-horizon climate goals to jobs, industrial strategy and regional development. Third, combining energy security with both regional value capture and

Table 2
Illustrative within-interview storyline linkages across institutional positions.

Respondent and institutional position	Lead storyline	Supporting storyline(s)	Evidence of explicit linkage within the response
R28 Applied research	Net-zero electricity delivery and deployment geography	Energy-security vulnerability; regional renewal; commercial opportunity	Argued that ‘if the UK wants net zero and energy security, we need floating at scale’, then linked FLOW’s nascent status and site-proximate assembly to onshoring, exports and regional employment. Described ‘energy security and decarbonisation’ as linked drivers: reducing hydrocarbon dependence makes electrification necessary, while FLOW provides access to deep-water resources and greater geographical diversity. Presented FLOW as necessary because fixed-foundation wind cannot deliver the required scale or access deeper waters. The additional home-grown capacity supports security, while ports and domestic supply-chain investment determine whether regional benefits are captured. Described national economic development as government’s ‘ultimate root’ rationale and commercial opportunity as industry’s principal rationale, connecting them through a government-industry partnership. Large-scale decarbonisation provided the parallel electricity-system case.
R37 Engineering and technical advisory	Energy-security vulnerability and system resilience	Net-zero electricity delivery and deployment geography	
R51 Developer or owner	Net-zero electricity delivery and deployment geography	Energy-security vulnerability; regional renewal	
R55 Government institution	Regional economic renewal and industrial value capture	Commercial opportunity; net-zero electricity delivery	

Note: Lead and supporting storylines reflect their relative emphasis within the cited interview account. The examples are illustrative rather than exhaustive and do not establish wider discourse structuration or institutionalisation.

commercial opportunity created a more materially grounded case, linking system resilience to economic benefit and resource development. The first combination is evident in the accounts of R37 and R54; the second in R28 and R57; and the third in R44 and R59. These combinations show how different problem constructions could converge on FLOW without requiring agreement about a single overriding purpose.

These patterns suggest that the emerging alignment did not depend on all storylines remaining subordinate to net zero. Energy security sometimes operated as a distinct lead account, while regional-renewal and commercial-opportunity storylines constructed different problems for which FLOW nevertheless appeared an appropriate response. What connected the sampled actors was therefore less a shared diagnosis than convergence on FLOW as a technology capable of addressing multiple problems. The overlapping actor distribution and within-interview co-occurrence provide evidence of discursive affinity within the sampled field, but do not establish that this alignment had achieved wider discourse structuration or institutionalisation. Its breadth created political flexibility; whether that flexibility could develop into resilience would depend on institutional commitments and the material credibility of the benefits attached to FLOW.

5. Discussion: discursive breadth, institutionalisation and material credibility

Table 3 synthesises the four problem-solution storylines identified in the interviews; the contribution each made to the emerging FLOW-supportive discursive alignment; and the conditions under which that contribution might prove resilient or vulnerable.

Building from this synthesis, the value of the data lies in the timing of its collection: it does not directly capture the later contestation that intensified during 2025, but reveals the emerging FLOW-supportive discursive alignment that preceded it. Read ex post, the findings suggest that support for Celtic Sea FLOW was broad but not necessarily consolidated. The four problem-solution storylines created discursive breadth by allowing actors with different diagnoses and institutional positions to converge on FLOW as an appropriate response. Following Hajer's distinction between discourse structuration and institutionalisation [16,17], such breadth can create political flexibility without ensuring resilience where the resulting alignment remains weakly institutionalised or its promised benefits lack material credibility.

The findings therefore qualify any simple claim that support for FLOW had moved “beyond” climate policy. Net zero remained an important policy frame, but it was not a single anchoring storyline to which the other storylines were necessarily subordinate. Rather, distinct problem-solution storylines made FLOW meaningful as a response to problems of low-carbon electricity delivery, energy security, regional renewal and commercial opportunity. In doing so, they translated FLOW into familiar political-economic priorities of domestic supply, system resilience, employment, industrial development and competitiveness. Following Ford and Newell [18], this discursive translation can be interpreted as regime accommodation, through which FLOW was made compatible with established political-economic priorities rather than justified through climate necessity alone. Regime accommodation therefore helps explain how discursive breadth was produced: actors could connect distinct problem diagnoses to FLOW through established political-economic priorities, while tying the alignment's credibility to performance across several policy domains.

A second vulnerability concerns deferred delivery. Several of the storylines that widened the emerging alignment were future-oriented: jobs, port redevelopment, supply-chain formation, industrial capability, regional renewal and commercial leadership. These claims helped translate a costly and less mature technology into a broader political-economic opportunity. However, they also created expectations, particularly around a regional-renewal socio-technical imaginary [11,12], whose durability depended on becoming institutionally stabilised and materially credible. If deployment proceeds slowly, if domestic

Table 3

Problem-solution storylines, contributions to emerging alignment and conditions affecting resilience or vulnerability.

Problem-solution storyline	Problem construction and FLOW response	Contribution to emerging alignment	Conditions affecting resilience or vulnerability
Net-zero electricity delivery and deployment geography	Within the net-zero policy frame, low-carbon electricity delivery is constructed as a problem of scale, seabed access and geographic reach; FLOW provides access to deeper-water resources and widens the spatial basis of offshore generation.	Brings decarbonisation, electricity-system expansion and offshore resource-access priorities into a shared case for FLOW.	Strengthened when FLOW is embedded in leasing, procurement, grid and infrastructure planning; vulnerable if high costs, delayed deployment or credible alternatives weaken the case that FLOW is necessary.
Energy-security vulnerability and system resilience	Dependence on imported fuels, fossil-price volatility and geographic concentration are constructed as sources of system vulnerability; FLOW is presented as a source of domestic and geographically diversified generation.	Enables FLOW to be supported through energy-security and system-resilience priorities, either independently of or alongside decarbonisation.	Strengthened when geographic diversification is recognised in energy-security and system planning; vulnerable if cost, deployment timescales or technological immaturity make FLOW appear irrelevant to near-term security.
Regional economic renewal and industrial value capture	Industrial decline and uneven regional development are constructed as problems requiring new employment, investment and industrial capability; FLOW is presented as a route to port redevelopment, supply-chain formation and domestic value capture.	Allows actors concerned with regional development, employment and industrial policy to recognise their priorities within the case for FLOW.	Strengthened by credible procurement commitments, port investment and domestic capability; vulnerable if jobs and investment are delayed, occur outside the region or are captured overseas.
Competitive advantage and commercial opportunity	Deep-water resources and an emerging global industry are constructed as opportunities that may be lost without early deployment; FLOW is presented as a route to first-mover advantage and future market positioning.	Extends the alignment by connecting FLOW to competitiveness, resource development and commercial leadership.	Strengthened by a credible project pipeline, timely deployment and developing domestic capability; vulnerable if delays, high costs or weak market growth erode the claimed first-mover opportunity.

Note: These conditions provide analytical criteria for interpreting potential resilience or vulnerability; they are not presented as outcomes directly measured by the interviews.

value capture remains uncertain, or if promised benefits are pushed further into the future, the regional-renewal and commercial-opportunity storylines may lose credibility. In this sense, delayed delivery is not only a technical or financial problem. The gap between the

regional-renewal imaginary and visible delivery of ports, jobs and supply chains could therefore weaken its credibility and give competing storylines grounds to depict FLOW as costly development without the promised regional return.

This is especially important for Celtic Sea FLOW because its regional case depends heavily on future economic participation. The technology is associated with ports, supply chains, skills and industrial renewal, but many of these benefits require coordinated investment, credible procurement choices, infrastructure readiness and institutional capacity. The interviews suggest that respondents recognised this conditionality: value capture was repeatedly linked to the presence of domestic capability, port readiness, supply-chain development and strategic alignment. Read *ex post*, this makes the baseline revealing: the same regional and industrial promises that helped broaden the emerging alignment also identify the institutional and material conditions on which its resilience depends.

The baseline also clarifies what this study cannot establish. Because opponents and affected publics were not interviewed, the analysis does not identify a competing discourse coalition or directly observe how the emerging FLOW-supportive alignment responds to organised contestation. If FLOW-supportive storylines do not shape how institutions frame the problem or become embedded in procurement and investment practices, they may have less capacity to withstand rival problem definitions, especially if promised regional and industrial benefits fail to appear. Under harder political conditions, competing storylines could construct the relevant problems around affordability, technological immaturity, environmental harm or marine spatial conflict, presenting FLOW as costly, risky or inappropriate rather than as an appropriate response to problems of electricity delivery, energy security or regional development. Future research should examine which actors reproduce these competing storylines and whether they displace, absorb or rearticulate the FLOW-supportive storylines identified here.

The wider implication for transition studies lies in how these processes connect. Different problem-solution storylines can create discursive affinity among actors with distinct diagnoses; regime accommodation helps make that convergence legible within established political-economic priorities; and the regional-renewal imaginary creates expectations against which delivery can be judged. Whether such an alignment endures may depend on institutional embedding and material delivery, neither of which these interviews measure directly. This interpretation is most applicable to emerging transition technologies whose costs remain high, delivery pathways are uncertain and political justification rests partly on promised regional or industrial benefits.

The contribution of the paper is therefore not to claim that Celtic Sea FLOW support has failed, nor to predict a specific political outcome. It is to show why the discursive structure of early support matters. By identifying the problem-solution storylines through which an emerging FLOW-supportive alignment was articulated, the paper provides an *ex ante* baseline for understanding how emerging low-carbon technologies become supportable before contestation intensifies.

6. Conclusion

This paper has examined how support for Celtic Sea floating offshore wind was constructed through problem-solution storylines among actors involved in or adjacent to its development before net-zero and offshore-wind politics became more openly contested. Its contribution is not to reconstruct the full politics of FLOW opposition, represent all affected publics, or measure later contestation directly. Rather, it provides an *ex ante* baseline of an emerging FLOW-supportive discursive alignment that can now be interpreted *ex post* in light of a political context that has since become more contested.

The analysis shows that support for Celtic Sea FLOW was assembled through overlapping problem-solution storylines rather than through consensus around a single rationale. Actors constructed FLOW as a response to four distinct problems: the scale and geography of low-

carbon electricity delivery; fossil-fuel dependence and geographic concentration in the energy system; industrial decline and uneven regional development; and the risk of losing industrial and commercial position in an emerging market. These different diagnoses converged on FLOW as an appropriate response. Their distribution and co-occurrence across institutional and system positions provide evidence of discursive affinity among the sampled actors, but do not establish a consolidated or institutionally embedded discourse coalition.

The baseline also reveals the conditions under which this alignment may be vulnerable. The coexistence of multiple storylines created discursive breadth and political flexibility, but this breadth did not guarantee resilience. Their distribution and co-occurrence provide evidence of discursive affinity within the sampled field, while not establishing wider discourse structuration or institutionalisation. A further vulnerability concerns deferred delivery. Claims around jobs, ports, supply chains, regional renewal and commercial leadership helped make FLOW politically meaningful, but they also created expectations whose credibility depends on coordinated investment and material delivery. If deployment proceeds slowly or if regional and industrial benefits remain unrealised, these storylines may lose credibility and create space for competing problem constructions.

The wider implication is that emerging low-carbon technologies depend not only on technical feasibility, cost reduction or policy support. They also depend on problem-solution storylines through which they are made worth supporting and through which they become credible, compatible and embedded in institutional practices and arrangements. A broad repertoire of justifications can help assemble support, but breadth should not be mistaken for resilience. This argument is most applicable where technologies remain costly or immature, delivery pathways are uncertain and support rests partly on future regional or industrial benefits. Under these conditions, an emerging alignment may remain vulnerable if it is weakly institutionalised or if promised benefits are not materially delivered.

Celtic Sea FLOW therefore offers a useful window onto the political vulnerability of support for net-zero technologies. It shows how an emerging technology can be made meaningful as a response to multiple problems, creating an alignment broad enough to accommodate different priorities – but not necessarily consolidated or resilient. Future research should examine how this alignment changes as projects move towards deployment, promised regional and industrial benefits are tested, and competing discourse coalitions emerge around affordability, environmental harm, technological risk or marine spatial conflict. The important question is whether these competing storylines displace, absorb or rearticulate the FLOW-supportive storylines identified here.

CRedit authorship contribution statement

Julian A. Gregory: Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Philipp R. Thies:** Writing – review & editing.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the collection of interview data, the authors used Microsoft Teams transcription services to generate interview transcripts (interviews conducted via Microsoft Teams), with the explicit permission of all interviewees. During the preparation of this work, the authors used ChatGPT (OpenAI) to help organise the data for analysis, and on occasions for better organisation of wording within paragraphs to improve readability. The authors reviewed and edited all AI-assisted outputs as necessary and take full responsibility for the content of the manuscript.

Declaration of competing interest

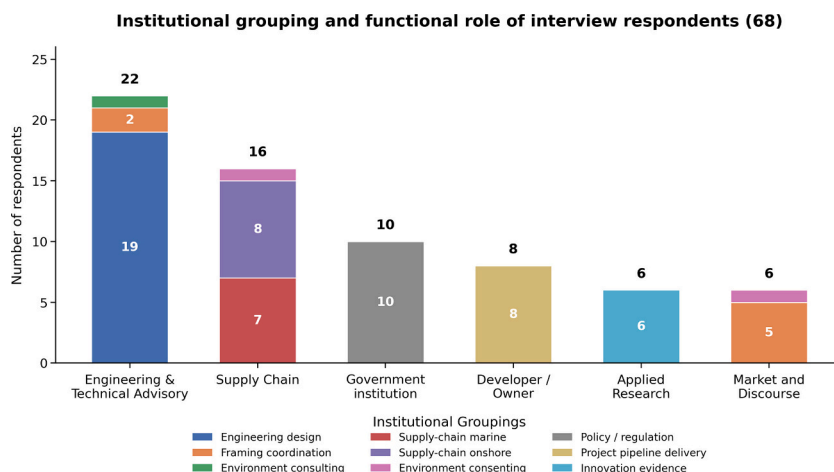
The authors declare that they have no known competing financial

interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Interview profiles

Respondent number	Institution profile	Expertise	Interview month
R01	Supply Chain	Offshore-wind	May 2024
R02	Engineering & Technical Advisory	Maritime wind engineer	May 2024
R03	Developer/Owner	FLOW technical Manager	May 2024
R04	Engineering & Technical Advisory	Maritime infrastructure and supply-chains	May 2024
R05	Engineering & Technical Advisory	Naval Architect	June 2024
R06	Engineering & Technical Advisory	Technical Risk	June 2024
R07	Engineering & Technical Advisory	Naval Architect	June 2024
R08	Engineering & Technical Advisory	Power Engineer	June 2024
R09	Supply Chain	Wind supply chain logistics	June 2024
R10	Supply Chain	Turbine and electrical engineer	June 2024
R11	Applied Research	Offshore-wind	June 2024
R12	Engineering & Technical Advisory	Director Marine Engineering	June 2024
R13	Engineering & Technical Advisory	Offshore-wind engineer	June 2024
R14	Engineering & Technical Advisory	Marine civil engineering and energy	June 2024
R15	Supply Chain	Director Offshore-wind supply chains	June 2024
R16	Engineering & Technical Advisory	Offshore wind analyst	June 2024
R17	Engineering & Technical Advisory	Director Energy storage technical advisor	June 2024
R18	Engineering & Technical Advisory	CEO Marine engineer	June 2024
R19	Developer/Owner	Head of regulation and Policy	June 2024
R20	Engineering & Technical Advisory	Consultant	July 2024
R21	Market and Discourse	Environment Consenting	July 2024
R22	Government institution	Senior Development Manager	July 2024
R23	Engineering & Technical Advisory	Executive Lead	July 2024
R24	Supply Chain	CEO	July 2024
R25	Engineering & Technical Advisory	Senior Associate Director	July 2024
R26	Engineering & Technical Advisory	Regional Director	July 2024
R27	Market and Discourse	Head of Skills for OW	July 2024
R28	Applied Research	Principal Portfolio Manager	July 2024
R29	Government institution	Economic Development Officer	August 2024
R30	Government institution	Policymaker	August 2024
R31	Market and Discourse	Head of Supply Chains	August 2024
R32	Government institution	Policymaker	August 2024
R33	Market and Discourse	Partner	August 2024
R34	Government institution	Policymaker	August 2024
R35	Applied Research	Offshore Wind	October 2024
R36	Applied Research	Offshore Specialist	October 2024
R37	Engineering & Technical Advisory	Consultant	November 2024
R38	Supply Chain	CEO	November 2024
R39	Supply Chain	Director	November 2024
R40	Supply Chain	Lead consultant	November 2024
R41	Market and Discourse	Director	November 2024
R42	Developer/Owner	Supply Chain Manager	November 2024
R43	Supply Chain	MD	November 2024
R44	Supply Chain	R&D Engineer	November 2024
R45	Engineering & Technical Advisory	Marine Engineer & Project Manager	November 2024
R46	Government institution	Asset Manager	November 2024
R47	Supply Chain	Environment Manager	November 2024
R48	Supply Chain	Chief Technology Officer	November 2024
R49	Supply Chain	Consultant	November 2024
R50	Engineering & Technical Advisory	Manging Partner	November 2024
R51	Developer/Owner	UK Supply Chain Leader	November 2024
R52	Government institution	Head of Offshore-wind Development	November 2024
R53	Supply Chain	MD	November 2024
R54	Applied Research	Offshore Wind	November 2024
R55	Government institution	COO	November 2024
R56	Applied Research	Marine Biology	November 2024
R57	Market and Discourse	Energy Journalist	November 2024
R58	Developer/Owner	O&M Manager	November 2024
R59	Developer/Owner	Chief Technology Officer	November 2024
R60	Supply Chain	MD	November 2024
R61	Engineering & Technical Advisory	MD	November 2024
R62	Supply Chain	Commercial Director	November 2024
R63	Government institution	Senior Funding/investment Manager	November 2024
R64	Engineering & Technical Advisory	Marine Energy Director	November 2024
R65	Developer/Owner	Head of UK + Eire Innovation Hub	November 2024
R66	Government institution	Senior Asset Manager	December 2024
R67	Engineering & Technical Advisory	FW & Maritime Decarbonisation Lead	December 2024
R68	Developer/Owner	Project Developer	February 2025

Appendix B. Profile breadth



Data availability

The data that has been used is confidential.

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