

# Thermodynamic attachments and Energy Materials: Cultural Responses to Sociotechnical Imaginaries in Lancashire and Cumbria

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Thesis Title

## Thermodynamic attachments and Energy Materials: Cultural responses to Sociotechnical Imaginaries in Lancashire and Cumbria

### THESIS STATEMENT

This thesis explores people's every-day interactions with energy materials, namely fossil fuels and nuclear waste, as well as a body of creative work (theatre, poetry, art projects) that imagines how people make sense of living entangled with these materials. The goal is to better understand why energy transitions to alternative sources as adaption appear to be limited, and to inform policymaking into considering people's views about energy futures.

## ABSTRACT

This thesis is the product of 24 months of ethnographic fieldwork and literary research in Lancashire and Cumbria. I explore how energy sources shape ordinary people's stories - both literary and experiential - about the ways they attach to historically embedded energy regimes and infrastructures, namely fossil fuels and nuclear. These energy infrastructures (coal, oil, nuclear) need to be fixed to continue to produce capital (Moore, 2015). Narratives emerging in the peripheries offer an insight into the ways these structures continue to pose issues that pertain to the livelihoods of the people living around them, and they also illuminate and problematise their use. They offer narrative moments where ordinary people tell stories about energy materials as a historical development of attachments to fossil fuels and nuclear energy regimes. I make two propositions in this thesis. The first one is that in order to transition to more sustainable energy sources and uses, we need to better understand why people's livelihoods, affects and mindsets are still to a large extent embedded into the fixed capital of already existing fossil fuel and nuclear infrastructures, which are seen as historical forms. In support of this argument, this thesis offers case studies focused on the North West of England, where energy infrastructures are aging, and energy sources are staged as historical forms. The second proposition pertains to the need of a more robust interdisciplinary collaboration between the

humanities and social sciences against the historicity of fixed energy capital, and to attend in more illuminating ways what lay people in the peripheries have to offer in their narratives. I also argue that in contemporaneity, energy transitions require a humanities-social sciences insight to spill into policy, in combination or even to position technoscientific solutions in a secondary place.

This study argues that our attachments to fossil fuels and other thermodynamic energy sources such as nuclear power are not merely technical systems; they are embedded in the cultural narratives and social practices of local communities. Cultural responses to energy regimes are shaped by energy attachments, necessitating a nuanced understanding of these factors for just transitions. Furthermore, this thesis asserts that energy policies require a more robust shift of paradigm that transcends purely technoscientific solutions. Through the theoretical lens of Affect Theory, New Materialism and Sociotechnical imaginaries theory, this project explores cultural artefacts that treat energy as a deep attachment which started with industrialisation in 19th century England. This study considers fossil-fuel energy as a fuel that created the legacy of the industrial revolution, imaginaries about the future and as a concept that creates contested infrastructures. To examine energy in those terms, I have focused my research on the region of Lancashire and Cumbria, two areas that are historically tied to the first industrial revolution. I see the region as a geographical space that was central to the birth of industrialisation, but also as space where various energy regimes collide and co-exist.

The first chapter analyses the Cotton Famine Poetry, offering insight into our first attachment to fossil fuels, as coal powered steam engines were used in the textile industry. The poems offer a unique view into the ways we live with energy materialities and demonstrate how urgent the attachments to these materialities became. The stories these poems tell make energy materials visible and offer a new way to look at the way we interact with them. The second and third chapters examine regional theatre plays written by playwrights in Lancashire and Cumbria that offer imaginaries of the future at the interplay of energy justice, climate change and science-informed performances. These chapters are informed by a multi-method enquiry that pertains to close reading, ethnographic accounts and autoethnography. The final chapter turns to infrastructures of energy in the region, tracing the legacy of nuclear power in the area, which still resonates with contemporary energy debates about the role of nuclear fuel as a sustainable source of energy, and the ever-present issue in the region of radioactive waste disposal.

Finally, the conclusion explores the contribution of regional narratives as a method to extract valuable lessons and continuities of otherwise obscured or neglected narratives of energy attachments.

## *Introduction*

### Embodying Energy: Affect, Time and Lived Experience

My earliest encounters with energy were visceral, unmediated by theory or policy, yet formative in shaping the questions this thesis seeks to address. As a child growing up in Greece, I remember vividly the pungent smell of petrol during long car journeys in my family's 1982 Ford Fiesta. This was not only a sensory experience that accompanied every trip to visit relatives but also an introduction to the inescapable entanglement between mobility, aspiration, and discomfort. That smell, mingling with the sense of enclosure in a moving metal box, produced an almost contradictory affective state: on the one hand, excitement about where we were going and what that mobility represented, a certain modernity, a form of belonging to a world in motion, and on the other, a subtle, lingering nausea that underscored the cost of this privilege. It is perhaps unsurprising that, in retrospect, I came to associate fuel with both possibility and unease.

Later, during my teenage years, I encountered another dimension of this entanglement when I boarded my first flight to the United Kingdom to begin my studies in English Literature. Again, there was the familiar feeling of unease: the heavy, chemical scent of jet fuel, the sensation of being propelled into an uncertain future, and the weight of realising that energy, in its most distilled form, was the precondition of mobility, migration, and transformation. Looking back,

this embodied awareness of energy's presence prefigured my later understanding of how energy systems structure not only infrastructures but also imaginaries of progress and belonging.

These formative experiences were mirrored and intensified during the Greek financial crisis of 2011–2015, when fuel poverty and precarity became defining features of daily life for many households. Living in a flat without central heating during a succession of particularly cold winters, I came to understand energy not as an abstract utility but as a force that inscribes itself directly on bodies and temporalities (Santamouris et al, 2014). The cold was more than physical discomfort; it became an affective state that compressed time into an anxious present, where the future felt suspended and the past seemed remote. Thermal discomfort brought a form of bodily knowledge: an acute awareness that energy shapes not only the built environment but also the texture of lived experience.

During that period, the broader social narratives circulating in Greece, stories of austerity, debt, and structural adjustment, were saturated with references to energy: the rising costs of heating oil, the struggle to keep homes warm, and the sudden resurgence of wood-burning stoves as makeshift solutions. It was a time when everyday life was punctuated by discussions about energy prices, alternative heating systems, and the ethical dimensions of consumption. I remember neighbours improvising with electric heaters and watching news reports documenting the health impacts of sustained cold. The collective awareness of energy scarcity became almost palpable, creating a shared sense of vulnerability but also a heightened consciousness of our reliance on material infrastructures.

These experiences were not simply biographical background but part of the scaffolding of my intellectual curiosity. They compelled me to reflect on how energy infrastructures, materialities,

and narratives become entangled with notions of progress, crisis, and survival. As I began to encounter theoretical frameworks in energy humanities and cultural studies, I recognised that my own early experiences echoed many of the questions these fields were asking: What does it mean to live in systems predicated on the extraction and combustion of fuel? How do people narrate their attachments to energy materials that are simultaneously life-sustaining and ecologically destructive? In what ways do these attachments become normalised, contested, or reimagined in moments of crisis?

This thesis emerges, in part, from the tension between the promise of energy as a means of achieving mobility, comfort, and prosperity, and the affective and ecological costs that such promises entail. It also stems from a desire to explore how narratives, whether in poetry, theatre, or everyday discourse, mediate the contradictions inherent in energy systems. In examining these questions, I have found it necessary to keep in view not only the historical conditions of energy regimes but also the intimate, bodily experiences that make energy materialities legible in daily life.

My research is shaped by a conviction that personal narratives and embodied experiences can provide valuable insights into broader cultural formations. In this sense, the personal is not merely anecdotal but forms part of the terrain in which energy imaginaries are produced and contested. The moments of unease I felt as a child and young adult were, in retrospect, early encounters with the affective dimensions of energy infrastructures, encounters that have since been distilled into a scholarly commitment to understanding how energy becomes entangled with social identities, temporalities, and ethical horizons.

This orientation also informs my methodological choices in this project: an insistence on attending to affective registers, on foregrounding situated experiences, and on exploring the ways in which narratives provide a medium through which people articulate their relationships to energy. It is from this foundation that the subsequent chapters unfold, combining literary analysis, ethnographic interviews, and narrative critique to illuminate how communities in Lancashire and Cumbria have engaged with energy regimes past and present.

### Research Underpinnings

Energy systems are more than technical infrastructures or economic necessities; they are cultural phenomena that mediate relationships between people, environments, and imagined futures. They are entangled with the everyday and the exceptional, shaping both the background conditions of ordinary life and the possibilities for social transformation. As LeMenager (2014) argues, fossil fuels have not only powered economies but also saturated cultural forms, providing the material substrate for narratives of progress and prosperity as well as stories of loss, nostalgia and crisis. To consider energy solely in terms of resource management or technological innovation is to overlook how profoundly it permeates the ways individuals and communities make sense of their circumstances and imagine their futures.

In the context of accelerating climate change, intensifying calls for decarbonisation and unprecedented infrastructural transitions, it has become increasingly important to examine how

attachments to energy are formed, sustained and challenged. These attachments are not simply rational calculations of cost and benefit. They are entangled with social identities, historical memories and affective investments that are often difficult to disentangle from broader cultural imaginaries (Szeman & Boyer, 2017; Daggett, 2019). In this sense, energy regimes function not only as assemblages of technology and policy but also as sites where ethical and emotional commitments are negotiated and expressed.

While a significant body of scholarship has demonstrated how energy infrastructures have shaped capitalism, colonial expansion and environmental degradation (Mitchell, 2011; Malm, 2016), less attention has been paid to the ways in which regional narratives and everyday cultural practices articulate, contest and reimagine these processes. The perspective of energy humanities offers a framework for exploring the cultural dimensions of energy transitions by foregrounding questions about representation, meaning and affect. It invites an inquiry into how lived experiences of energy are expressed through diverse forms, including literature, theatre, oral histories and community activism.

Lancashire and Cumbria provide a particularly compelling context for this research. Historically, these regions were central to the Industrial Revolution, fuelled by coal and steam, and became emblematic of Britain's rapid industrial growth. The legacies of this period are inscribed in the built environment, in the landscapes marked by extraction and production, and in the collective memories of communities whose lives were shaped by industrial labour. The Industrial Revolution in these regions was not only an economic transformation but also a profound cultural shift, as E. P. Thompson (1967) has described in his analysis of changing conceptions of time and discipline. Fossil-fuelled production brought new rhythms of life, altered social relations and produced imaginaries of modernity that continue to inform local identities.

Today, Lancashire and Cumbria are often referred to as the ‘Energy Coast’, a term that captures both continuity and rupture. These regions host an array of infrastructures, including nuclear power stations, decommissioning sites, offshore wind farms and proposals for new coal mines and fracking projects. This coexistence of old and new energy regimes creates a landscape of contested futures, where official narratives of energy security and technological progress coexist uneasily with local concerns about risk, environmental harm and social justice. The concept of sociotechnical imaginaries, as articulated by Jasanoff and Kim (2015), is helpful here because it highlights how visions of collective futures are produced and stabilised through the interplay of policy, technology and culture.

By examining this regional context, the research aims to demonstrate that energy transitions are not abstract policy objectives but lived processes that are experienced unevenly across different communities. The stories that people tell about energy are shaped by specific histories, material conditions and affective attachments. These stories, whether expressed in poetry, theatre or interviews, help to define what kinds of futures are thinkable and what remains outside the bounds of legitimacy or possibility.

The nineteenth-century Cotton Famine poetry offers a unique lens into how working-class writers responded to the material transformations of coal-powered industrialisation. These texts are significant not only as historical documents but as cultural artefacts that reveal how energy regimes were made meaningful in everyday life (Hitchman & Hitchman, 1997; Rennie, 2018). They show that even in the nineteenth century, energy was not simply a question of economic growth but also a site of anxiety, ambivalence and imaginative speculation. The poetry published in regional newspapers was part of a broader public discourse in which ordinary people claimed a voice in defining the significance and consequences of industrialisation.

Contemporary plays and performances in the North West of England offer a different but related perspective. These works engage critically with present-day energy infrastructures and the

promises and uncertainties they carry. They explore the ethical dilemmas posed by nuclear waste, the environmental costs of fossil fuel extraction and the contested narratives of renewable energy development. As Goodbody and Johns-Putra (2019) have argued, literary and artistic representations are indispensable in illuminating the ethical complexities and affective dimensions of ecological crisis because they provide spaces where audiences can reflect on their own complicity, hopes and fears.

Ethnographic interviews with residents, activists and cultural practitioners add another layer to this inquiry by foregrounding situated knowledges and lived experiences (Pink, 2012). These narratives provide insight into how people understand and navigate the risks and promises of energy infrastructures, how they interpret policy discourses and how they construct their own imaginaries of sustainability and decline. The interviews also reveal how temporalities of past, present and future are negotiated in everyday life. For instance, memories of industrial employment, anxieties about contamination and hopes for alternative energy economies often converge in accounts that do not fit neatly within the linear narratives of progress promoted by official institutions.

By placing these diverse materials in conversation, the research develops a transhistorical perspective on energy imaginaries that emphasises both continuity and transformation. It asks how cultural texts and everyday narratives make visible the entanglement of materiality and meaning, and how they contribute to the co-production of sociotechnical imaginaries (Jasanoff, 2004). This approach allows for a more nuanced understanding of how communities articulate their attachments to energy and how they contest or reconfigure dominant framings.

The rationale for this project is therefore twofold. First, it seeks to address the gap in scholarship regarding regional and cultural dimensions of energy transitions. Second, it proposes that narrative is both an object of analysis and a methodological resource for investigating the ethical, affective and imaginative dimensions of energy systems. By exploring the ways in

which energy is narrated in historical texts, contemporary cultural production and personal testimonies, the research aims to illuminate how futures are anticipated, contested and made thinkable in the present.

This focus on narrative also reflects a conviction that stories have material consequences. They shape public perceptions, inform policy debates and influence the practices through which communities engage with infrastructures. Understanding these dynamics is essential if we are to develop more equitable and sustainable approaches to energy transition that are attentive to the lived experiences and cultural imaginaries of those most affected by them. The issues outlined above are not addressed in a vacuum. They emerge from, and contribute to, a growing body of scholarship that has sought to situate energy within cultural, political, and affective frameworks. To understand how I am situating this thesis, it is necessary to engage critically with these fields, tracing both their insights and their limitations. The following literature review examines four strands of work most relevant to my project: the Energy Humanities, sociotechnical imaginaries, narrative studies, and affect/materiality. Each body of scholarship offers conceptual and methodological tools that inform my analysis, but each also contains omissions and blind spots that this thesis seeks to address. By foregrounding the intersections and tensions across these strands, the review establishes the intellectual ground from which my own arguments depart.

## Literature Review

### 1.1 Energy Humanities

Energy Humanities has rapidly evolved into a vibrant interdisciplinary field that interrogates how energy regimes shape cultural, political, and material relations. Szeman and Boyer (2017) define it as a project concerned with ‘the ways that energy and energy systems enable, constrain,

and condition forms of culture' (p. 5), arguing that energy is not a backdrop to human affairs but constitutive of them. Their anthology makes clear that cultural forms do not merely reflect energy systems but actively participate in naturalising, contesting, and reimagining them.

Timothy Mitchell's *Carbon Democracy* (2011) and Andreas Malm's *Fossil Capital* (2016) are often regarded as foundational texts in the Energy Humanities, offering historical materialist accounts of how coal, oil, and steam power reconfigured political institutions, labour regimes, and ecological systems. Mitchell demonstrates how the logistical properties of coal, its bulkiness, storability, and dependence on labour-intensive supply chains, created opportunities for democratic contestation, while the fluidity and concentration of oil reshaped political economies and geopolitical orders. Malm traces how steam power was adopted not merely for efficiency but as a strategy of class discipline, tying fossil energy to capitalist expansion and labour control. Malm insists on situating the transition to steam within the rise of industrial capitalism, demonstrating that energy technologies were never neutral innovations but deeply implicated in class struggle and ecological breakdown. Both texts make visible the structural power of energy infrastructures, foregrounding the ways in which materials and technologies shape the very possibility of political life. Yet their focus on large-scale economic and institutional transformations leaves less room for the cultural and vernacular dimensions of how such transitions were lived and narrated. LeMenager's *Living Oil* (2014) extends these structural arguments into the cultural domain, showing how petroleum saturates literature, film, photography, and everyday practice. For LeMenager, oil is not only an economic substrate but a cultural one, underwriting imaginaries of prosperity, freedom, and modernity, even as it contributes to ecological precarity. Her work demonstrates that energy materials are aesthetic as well as infrastructural, woven into what she terms 'petromelancholia', a condition of recognising oil's ecological destructiveness while remaining affectively attached to it. This insistence on oil's cultural embeddedness provides an important bridge between political

economy and cultural analysis. However, the focus on oil as the paradigmatic energy form raises questions about whether comparable cultural imaginaries of coal, nuclear, or renewables have received equal attention. This thesis responds to that gap by exploring precisely these cultural registers, analysing how nineteenth-century Cotton Famine poetry and twenty-first-century performance texts articulate the affective and symbolic stakes of energy transition in regional contexts. I also contribute to broadening that field of inquiry by examining not only fossil fuel imaginaries but also the cultural inscriptions of nuclear energy, legacy coal sites, and renewables in the North West of England. In doing so, I demonstrate that regional cultural forms (poetry, theatre, interviews) can illuminate attachments to energy beyond the oil-centric horizon that still structures much of the scholarship.

Bellamy and Diamanti (2018) and Yaeger (2011) have similarly emphasised the affective and symbolic dimensions of energy, developing the notion of an ‘energy unconscious’ encoded in cultural artefacts. For Yaeger, energy shapes literature at the level of metaphor, narrative form, and affective tone, while Bellamy and Diamanti argue that fossil fuels are politically charged materialities that organise not only economies but also temporalities and social imaginaries. These perspectives are crucial in showing how energy haunts cultural production, not always explicitly but through latent figures of depletion, exhaustion, or boundless productivity. Yet much of this work analyses canonical or global cultural texts, leaving relatively unexplored how minor, working-class, or regional forms articulate an energy unconscious. This thesis engages directly with that absence: by bringing the Cotton Famine poetry and community theatre into the frame, it demonstrates how the energy unconscious is expressed in cultural forms often excluded from the metropolitan canon but central to understanding the uneven geographies of energy imaginaries.

Cara Daggett’s *The Birth of Energy* (2019) offers a different kind of intervention, turning to the genealogy of thermodynamic science as a disciplinary framework bound up with ideologies of

productivity, efficiency, and accumulation. Daggett shows that the concept of energy, emerging in the nineteenth century, was not a neutral scientific discovery but a political formation that disciplined bodies and time, embedding Protestant work ethics into the management of heat, labour, and entropy. This reorientation is crucial because it shifts attention from energy as resource to energy as epistemology: a framework for ordering life, work, and morality. For this thesis, Daggett's account provides the conceptual hinge for developing the idea of 'thermodynamic ethics,' which situates energy as both material and moral force. Yet where Daggett's analysis remains largely theoretical and historical, this study explores how thermodynamic ethics are lived and contested in specific regional contexts, showing how literary and performative texts grapple with the moral and affective contradictions of energy transitions.

Dipesh Chakrabarty's (2009; 2021) influential mediations similarly expand the scope of energy debates by placing them within the planetary frame of the Anthropocene. Chakrabarty argues that fossil-fuelled modernity forces a rethinking of historical temporality itself, collapsing the distinction between human history and geological time. This planetary perspective has been vital for situating energy transitions within the *longue durée* of climate change, yet it risks abstracting energy from its localised, lived dimensions. The Anthropocene as a conceptual horizon can sometimes obscure the situated struggles of communities negotiating energy transitions in uneven geographies. This thesis takes up Chakrabarty's challenge but redirects it to the regional scale, demonstrating how global temporalities of energy and climate are refracted through local histories of industrialisation, deindustrialisation, and infrastructural contestation in Lancashire and Cumbria. In doing so, it positions regional cultural analysis not as an exception to planetary debates but as a necessary counterpoint that grounds them in lived experience.

More recent contributions have significantly broadened the conceptual scope of the Energy Humanities, moving beyond the field's initial focus on fossil capital and the oil century. Bonneuil and Fressoz's *The Shock of the Anthropocene* (2016) reframes the Anthropocene not as a neutral descriptor of planetary change but as a deeply cultural and political project, one in which energy regimes and their imaginaries play a central role. They demonstrate that energy cannot be separated from the ideologies of mastery, progress, and acceleration that underpinned industrial modernity and that continue to shape present-day debates on decarbonisation. Clark and Yusoff (2017) push this further by insisting that energy histories are inseparable from histories of racialisation, dispossession, and extractive violence, positioning fossil modernity as a project structured as much by inequity as by technological advance.

In parallel, anthologies such as *Fueling Culture* (Szeman, Wenzel, & Yaeger, 2017) and *Energy Humanities: An Anthology* (Szeman & Boyer, 2017) consolidate the field by assembling a wide range of conceptual entries on coal, oil, nuclear, electricity, and renewables. These collections have been crucial in defining the field's breadth and in demonstrating the cultural centrality of energy across multiple domains. At the same time, their format often privileges breadth over depth, producing a conceptual mapping of the field rather than sustained empirical engagements with specific cultural forms or regions. As a result, the regional, the vernacular, and the everyday have frequently remained under-examined in comparison with more metropolitan or planetary scales of analysis.

Scholars have begun to respond to this tendency. Wenzel (2019) argues that world literature provides a valuable vantage point for apprehending climate crisis and energy transitions as global yet asymmetrically experienced phenomena. His call to scale outwards is important, yet it largely privileges literary traditions that circulate internationally, leaving the question of how energy imaginaries are produced and contested in local or regional cultural settings less fully explored. Bellamy (2021) similarly highlights speculative fiction as a form of energy critique,

but his focus falls on genres of Anglophone literature that tend to foreground global imaginaries of collapse and transition rather than the embedded narratives of specific communities.

Even where non-fossil energy sources enter scholarly analysis, they are often approached through the lens of policy imaginaries or elite cultural forms. Hecht's *Being Nuclear* (2012) examines the global circulation of nuclear technologies and their political imaginaries, while Chilvers and Pallett (2018) analyse energy publics as co-produced through governance and participation, proposing a relational agenda for research on renewables and energy democracy. Both are important contributions, but they direct attention primarily towards institutional discourses and policy frameworks, rather than to cultural texts and vernacular practices that reveal how energy is lived, narrated, and contested on the ground.

It is in this space that I am situating the present thesis. By examining nineteenth-century Cotton Famine poetry, contemporary theatre in North West England, and interviews with residents, activists, and cultural producers, the study expands the Energy Humanities archive to include cultural forms that are both regionally situated and historically layered. In doing so, it demonstrates that coal, nuclear, and renewable energies generate imaginaries that are as culturally and politically consequential as those organised around oil, but that they are articulated in distinct ways across different genres, temporalities, and communities. This approach not only diversifies the field's empirical base but also insists on the importance of the regional and the vernacular as critical sites where energy imaginaries are shaped, contested, and reimagined.

Despite this richness, the field has exhibited certain tendencies in emphasis. Much Energy Humanities research has concentrated on global or metropolitan scales and on canonical cultural forms such as the novel, film, and media (Wenzel, 2019; Yaeger, 2011). This emphasis has been generative in establishing energy as a central category of cultural analysis, but it has left

comparatively less space for regional and non-elite cultural productions. As Macdonald (2013) observes, much Energy Humanities scholarship has tended to privilege global and systemic perspectives, which can obscure the ways energy regimes are mediated through local histories, working-class experiences, and minor cultural forms.

Similarly, while the field has convincingly demonstrated the saturation of energy in everyday life, relatively few studies have examined how communities themselves narrate transitions through participatory forms such as theatre, grassroots art, or oral history. Carter and Cunsolo (2020) suggest that paying closer attention to such practices can surface different registers of extraction and dependence that elude more global frameworks. It is precisely this register that my thesis engages: by focusing on Lancashire's Cotton Famine poetry and contemporary theatre in Cumbria, I foreground cultural productions that emerge outside metropolitan or elite literary circuits, but which are deeply entangled with energy regimes past and present.

There are also methodological limits. Energy Humanities has excelled in close reading and conceptual critique, but it has rarely combined textual analysis with ethnographic or participatory methods. Jenkins' (2018) work on nuclear imaginaries notes this as an ongoing challenge: bridging cultural texts with lived experiences of energy. My project takes up this opportunity by combining archival literary analysis with interviews and performance ethnography, extending Energy Humanities into transdisciplinary terrain.

In short, Energy Humanities has converged on the importance of energy as a cultural force, but has tended to privilege global, canonical, and text-based analysis. This thesis contributes by extending the field into regional, working-class, and participatory contexts, situating them within the *longue durée* of energy transitions in Northwest England.

## 1.2 Sociotechnical Imaginaries

The concept of sociotechnical imaginaries, developed by Jasanoff and Kim (2015), provides a crucial framework for understanding how energy futures are collectively envisioned and materially enacted. Jasanoff defines them as ‘collectively held, institutionally stabilised, and publicly performed visions of desirable futures’ (2015, p. 4). Crucially, these imaginaries are not merely discursive embellishments layered onto technological development; they are performative infrastructures that organise expectations, legitimise policies, and shape technological trajectories.

This framework has been especially influential within Science and Technology Studies (STS), where it has enabled scholars to track how scientific and technological projects are sustained by visions of national destiny, modernisation, or sustainability. Yet imaginaries also extend beyond the policy arena into the cultural and affective domains in which energy systems are narrated, debated, and contested. Appadurai’s theorisation of the ‘social imaginary’ (1996) situates imagination as a constitutive social practice, inseparable from global flows of media, migration, and aspiration. Beck’s *Risk Society* (1992) adds a further dimension, foregrounding how modernity is defined not only by technological advance but by anticipatory orientations toward risk, uncertainty, and catastrophe. Together, these approaches emphasise that imaginaries are not passive reflections of sociotechnical systems but active forces that structure governance, participation, and legitimacy.

At the same time, the literature on sociotechnical imaginaries has tended to privilege certain scales and sites of analysis. Much of the canonical work has examined national policy frameworks, science and technology governance, or elite institutional discourses. While these accounts have yielded valuable insights into how states mobilise futures to secure authority, they risk underplaying how imaginaries are also articulated in cultural texts, vernacular

practices, and everyday narratives. Imaginaries are not confined to ministries or laboratories; they emerge in poems written in the midst of industrial crisis, in plays that dramatise infrastructural dilemmas, and in the testimonies of residents negotiating the presence of nuclear facilities or the legacies of coal.

This thesis responds to these tendencies by repositioning imaginaries as phenomena that are not only institutionally stabilised but also culturally and affectively produced. By analysing nineteenth-century Cotton Famine poetry alongside contemporary theatre and community interviews, I foreground imaginaries at the intersection of aesthetic form and lived experience. In doing so, I extend the concept into registers that are often overlooked in STS: the embodied, the affective, and the regional. This is not to dismiss the importance of national or global imaginaries but to suggest that they are always mediated through situated practices that anchor them in particular times, places, and materials.

In this sense, the project positions itself within, but also slightly askew from, the dominant trajectories of the imaginaries literature. Where STS has shown how imaginaries legitimise technological and policy agendas, my analysis demonstrates how they are also contested, reconfigured, and narrated in cultural production. This contributes to a broader methodological point: that imaginaries cannot be fully understood without the interpretive tools of literary and cultural analysis, which reveal how futures are made intelligible and affectively resonant. By weaving together STS with Energy Humanities and narrative inquiry, the thesis develops a transdisciplinary account of sociotechnical imaginaries that situates them not only in the decisions of policymakers but in the stories, performances, and attachments through which energy futures are lived and imagined.

As I noted previously, much of the existing scholarship on socio-technical imaginaries has examined imaginaries at the national or institutional level. Jasanoff and Kim (2009) analyse how nuclear power was imagined differently in South Korea and the United States, shaping

divergent technological pathways. Felt (2015) explores how European science policy mobilises imaginaries of publics and participation. In the British context, Chilvers and Pallett (2018) show how competing visions of public engagement shape energy governance, highlighting the multiple ways in which publics are constituted in renewable energy transitions. More recently, Turnhout et al. (2020) demonstrate how climate imaginaries are articulated through international policy and science–policy interfaces.

In short, while sociotechnical imaginaries research has been invaluable in analysing the visions of states, scientists, and policymakers, this thesis contributes by showing how imaginaries also emerge from working-class poetry, grassroots performance, and everyday narratives of energy. By doing so, it reframes imaginaries as cultural as well as political projects, revealing how visions of energy futures are produced, circulated, and contested in the textures of regional life.

### 1.3 Narrative Analysis

Narrative has long been central to the humanities as a mode of interpretation, but recent decades have seen its conceptual scope expand across disciplines, including sociology, anthropology, and performance studies. Riessman (2005) argues that narratives are not merely descriptive but performative: they organise temporality, structure meaning, and negotiate social identities. De Fina (2009) emphasises the co-constructed nature of narrative, shaped in interaction between speaker and audience, while Somers (1994) famously framed narrative as a foundational mechanism through which individuals and groups articulate identity and political belonging. This broadening of narrative theory has opened space for applying narrative approaches to ecological and energy contexts. Yet here, important gaps remain. Energy Humanities, for instance, has drawn extensively on cultural theory and political economy but has rarely engaged

directly with the tools of narrative inquiry. Conversely, narrative scholars have produced sophisticated accounts of temporality, interaction, and identity, but have seldom applied these insights to the specific challenges of energy and environmental transition. This disjuncture provides an opportunity for methodological innovation: to examine how stories about energy not only represent but also enact attachments, values, and imaginaries.

In anthropology and sociology, Czarniawska (2004) and Polletta (2006) have demonstrated how narratives function as powerful social devices, structuring collective memory and providing resources for political mobilisation. Narratives do not merely recount events; they organise them into meaningful sequences that confer legitimacy, justify actions, and bind communities together. These insights are especially pertinent to energy transitions, which require the construction of new collective futures yet remain constrained by deeply sedimented attachments to fossil fuels. Polletta's work in particular shows how stories can naturalise inequality as easily as they can galvanise resistance, reminding us that the persistence of extractive energy regimes cannot be explained only in terms of technological lock-in or political economy but also in terms of narrative durability.

Frank's *Letting Stories Breathe* (2010) develops this argument by introducing the notion of 'narrative repertoires': the culturally available sets of stories through which people make sense of their circumstances. These repertoires circulate socially, accumulate authority through repetition, and shape the horizon of what can be imagined. Applied to energy, this perspective helps explain why cultural forms continue to invoke coal, oil, and industrial labour even in an era when their ecological destructiveness is widely recognised. Fossil fuels have become narratively entwined with imaginaries of modernity, prosperity, and endurance to such a degree that they remain the default horizon against which alternative energy futures are measured.

This dynamic is central to the argument of this thesis. By juxtaposing nineteenth-century Cotton Famine poetry with contemporary theatre and community testimony in Lancashire and

Cumbria, I demonstrate how energy narratives are not simply reflections of material infrastructures but active forces that stabilise or unsettle collective imaginaries. Poems that linked coal with endurance and moral discipline in the 1860s continue to echo in twenty-first-century debates about nuclear power, where similar themes of sacrifice, resilience, and obligation reappear. Narrative analysis, therefore, offers not just a way of interpreting cultural texts but a means of tracing how repertoires of energy imaginaries endure across temporal scales, shaping both the persistence of fossil-fuel attachments and the difficulty of envisioning post-carbon futures.

Performance studies provide another important strand for thinking about how cultural production negotiates energy and ecology. Taylor (2003) conceptualises performance as a repertoire of embodied knowledge, a living archive that stages cultural memory, social conflict, and environmental crisis. Her distinction between the archive (texts, documents, and records) and the repertoire (embodied practice, gesture, performance) has been especially influential in framing theatre as a site where knowledge is transmitted through embodied enactment rather than textual permanence. This insight has been taken up by ecodramaturgy, which emphasises how performance registers ecological crisis in ways that exceed discursive representation.

Chaudhuri's *Staging Place* (1994) first articulated how theatre mediates environmental imagination, situating ecological concerns within the politics of staging and representation. More recently, May (2021) has argued that ecodramaturgy functions as a practice of world-making, providing audiences with experimental encounters with environmental futures. Woynarski (2020) extends this line of thought by showing how contemporary theatre negotiates ecological collapse, infrastructural entanglements, and more-than-human relations, foregrounding theatre's capacity to model sustainability and unsettle anthropocentric assumptions. Angelaki (2017) and Reid (2020) likewise demonstrate how contemporary British drama frequently turns to dystopian and speculative forms as a means of grappling with

environmental crisis, staging energy and ecology not as distant abstractions but as embodied, affective, and socially situated dilemmas.

My own analysis builds on these insights but deliberately approaches theatre from a primarily textual and literary-critical perspective. Rather than conducting dramaturgical or performance analysis, I treat playscripts such as *North Country* (Hayer, 2016), *Tidelands* (Hayer, 2018), and *Fusion* (Larkin, 2018) as cultural texts in which language, metaphor, and narrative form do the work of staging energy imaginaries. For instance, in *Tidelands* the figure of water operates simultaneously as ecological agent, temporal marker, and cultural boundary, articulating anxieties about climate futures through a material metaphor grounded in the estuarine landscapes of the North West. *North Country* mobilises the temporality of apocalypse and rebirth to stage systemic collapse and recovery in post-pandemic Northern England, linking the legacies of industrialisation with the lived experience of survival and resilience. *Fusion*, by contrast, explores nuclear imaginaries through the story of an immigrant young woman, juxtaposing the rhetoric of scientific innovation with the legacy of the nuclear sublime. Taken together, the plays render visible the contradictions, attachments, and contested futures that characterise contemporary energy transitions. This textual approach enables a dialogue with the work of Woynarski and others without simply repeating it. Where ecodramaturgy often privileges the embodied and performative dimensions of theatre, my analysis foregrounds how figurative language, narrative structure, and symbolic geography shape collective understandings of energy. By placing these readings in conversation with interviews conducted with playwrights and cultural practitioners, I highlight how textual strategies are consciously deployed as tools of inquiry, allowing creative practitioners to grapple with socioecological dilemmas and to intervene in public imaginaries.

Through this dual attention to text and practitioner testimony, the thesis demonstrates that theatre functions as both a cultural repertoire and a narrative archive of energy futures. It reveals

how plays from the North West of England, emerging from a region already saturated with energy infrastructures, inscribe the contradictions of nuclear dependence, fossil fuel debates, and renewable aspirations. In doing so, my work extends the concerns of performance studies into the domain of Energy Humanities, showing how theatre not only stages ecological crisis but narrates the cultural politics of energy transition in regionally situated and materially attentive ways.

Recent developments in narrative theory have sought to broaden the field in important and sometimes provocative ways. Caracciolo (2021), for example, pushes for a narratology that is responsive to nonhuman agency and ecological materialities, arguing that stories cannot be treated as exclusively human artefacts but must be understood as emergent from relational assemblages that include environments, infrastructures, and technologies. James and Morel (2020) similarly propose the concept of ‘narrative ecologies’, foregrounding the co-constitution of stories, communities, and environments. These moves are particularly relevant to the study of energy, where infrastructures and materials (coal seams, nuclear waste, wind farms) are not passive backdrops but active participants in the stories communities tell about their pasts and futures.

Despite recent innovations, the broader field of narrative scholarship still tends to fall into a familiar bifurcation. Literary and performance analysis has produced powerful readings of aesthetic and symbolic form (Abbott, 2008; Herman, 2013), but when detached from lived practice it risks a formalist abstraction. Conversely, ethnographic approaches to narrative (Mattingly, 1998; Gubrium & Holstein, 2009) excel at capturing situated experience yet often underplay the aesthetic and historical repertoires that render those experiences legible. Much of this work remains centred on domains such as illness, trauma, or political mobilisation. While enormously valuable, these orientations have meant that narrative theory has paid comparatively less attention to how infrastructures, environments, and materials shape narrative

form. Even recent expansions into ecological narratology (Caracciolo, 2019) or narrative ecologies (James & Morel, 2020) tend to theorise ‘ecology’ metaphorically, with less engagement in socio-material contexts such as energy and infrastructure.

It is this gap that my project addresses. I bring together textual and ethnographic analysis within a single narrative framework. My approach demonstrates that energy imaginaries cannot be understood through symbolic form or lived experience in isolation; they emerge in the interplay between cultural repertoires, embodied testimony, and material infrastructures. In nineteenth-century poetry, coal functions both as a metaphor for endurance and as a lived presence in industrial life. In contemporary theatre, nuclear energies are staged through speculative ‘chronotopes,’ what Bakhtin (1981) defined as configurations of time and space that organise narrative experience, so that infrastructural futures are dramatised as both imminent and long-term, intimate and planetary. In interviews, residents and practitioners narrate their attachments to energy in ways shaped by these longer cultural histories, showing how past imaginaries continue to inflect present practices. By placing these domains into dialogue, my project both extends and unsettles narrative theory. It grounds Caracciolo’s ecological narratology (2019) and James and Morel’s narrative ecologies (2020) in historically and materially specific practices, showing how energy infrastructures configure cultural meaning. At the same time, it draws on insights from science and technology studies (Latour, 1987; Jasanoff, 2004; Barry, 2001; Barry & Born, 2013) to challenge the compartmentalisation that continues to divide literary, ethnographic, and STS approaches. Taken together, these perspectives demonstrate how narratives travel across genres, temporalities, and registers, and how they mediate relationships between culture, technology, and environment. In this way, narrative theory becomes not just a methodological resource but the conceptual glue binding literary analysis, ethnography, and STS. It enables a transdisciplinary approach that accounts for how energy imaginaries are produced, circulated, and contested in both text and practice.

Developments in the Energy Humanities have pushed narrative theory in directions that emphasise the material, ecological, and more-than-human dimensions of storytelling. Robert Butler (2016), Ursula Heise (2016), and Serenella Iovino and Serpil Oppermann (2014) argue that ecocriticism and material ecocriticism demonstrate how narratives are not only human artefacts but also shaped by the agencies of landscapes, infrastructures, and environments. This work extends narrative analysis into ecological registers, insisting that matter itself participates in the formation of stories.

Such concerns are also visible in readings of speculative genres. Googasian (2022) shows how the tropes of space opera, seemingly detached from earthly concerns, remain saturated with assumptions of infinite energy, infrastructural expansion, and extractive logics. Even when operating in the realm of fantasy, these narratives reproduce entrenched imaginaries of energy, demonstrating the persistence of cultural repertoires that equate progress with abundance.

Imre Szeman's theorisation of petrocultures (2013; 2017) makes a parallel argument at a broader scale: oil is not just a resource but an epistemological framework that saturates cultural production, mediating imaginaries of modernity and prosperity. Timothy Morton's concept of 'hyperobjects' (2013) further underscores the difficulty of narrating phenomena such as climate change and fossil economies, whose vastness destabilises temporal and causal comprehension. Together, these perspectives highlight the narrative challenges posed by energy: how to make legible forces and infrastructures that are at once intimate and planetary, immediate and intractably slow.

The so-called 'nonhuman turn' adds a further layer, with scholars such as Joni Adamson (2012) and Eva Haifa Giraud (2019) demonstrating how Indigenous storytelling and multispecies relationality demand narrative frameworks that decentre the human. Their work shows that stories are not only about people but emerge from entangled co-presences of communities, environments, and material entities. This insistence on more-than-human agency reframes

narrative itself as a site of ethical negotiation, where ecological attachments and responsibilities are articulated.

My project builds on and extends these interventions by grounding them in the cultural productions of Lancashire and Cumbria. The Cotton Famine poetry, contemporary theatre, and community testimonies demonstrate how energy narratives are formed not only through aesthetic or symbolic repertoires but also through infrastructures, materials, and lived affective attachments. The coal seam, the nuclear repository, and the wind farm are not simply backdrops to human stories; they are constitutive elements of those stories, shaping how communities imagine endurance, crisis, and transition. In this way, narrative theory becomes indispensable for understanding energy imaginaries at multiple scales on the symbolic, embodied, and the material and prepares the ground for the next section of this thesis, which turns explicitly to affect and materiality.

#### 1.4 Affect and Materiality

Where narrative analysis highlights how stories structure meaning and identity, an attention to affect and materiality allows us to consider how energy systems are lived and felt in ways that exceed representation. Affect is not reducible to emotion or discourse; it registers as intensities, atmospheres, and embodied experiences that circulate socially. As Brian Massumi (2002) influentially argued, affect is ‘a prepersonal intensity corresponding to the passage from one experiential state of the body to another’ (p. 27). For Sara Ahmed (2004), affect moves between bodies, attaching value to objects and orienting collectives through shared feelings of fear, hope, or resentment. These insights have been increasingly mobilised within ecocriticism and energy humanities, where scholars recognise that climate change and fossil-fuel dependence are not

only material problems but affective ones, sustained by cultural attachments and visceral investments (Szeman & Boyer, 2017).

This attention to affect is crucial for energy studies because fossil fuels endure not only through political economy but through what Lauren Berlant (2011) terms ‘cruel optimism’: attachments to systems that promise prosperity and security yet foreclose livable futures. Coal in the nineteenth century was both despised and cherished: it polluted lungs and landscapes but powered work, wages, and a sense of endurance. Cotton Famine poetry exemplifies this ambivalence, articulating both bitterness toward mill-owners and a providential faith that coal-driven labour was part of a divine economy. Berlant’s theorisation clarifies why such contradictory attachments persist. As she writes:

A relation of cruel optimism exists when something you desire is actually an obstacle to your flourishing. It might involve food, or a kind of love; it might be a fantasy of the good life, or a political project. What’s cruel about these attachments is that the subjects who have them are also worn out by them (Berlant, 2011, p. 1).

This framework provides a powerful way of reading nineteenth-century workers’ poetry and contemporary theatre alike. In the Cotton Famine poems, coal and mills were necessary for survival but also the very conditions of suffering. In Ergon Theatre’s *The Wicked Problem*, audiences deliberated over the moral culpability of a worker reliant on coal, a contemporary staging of cruel optimism in which survival itself reproduces systemic harm. Affect, in this sense, is not only an individual experience but a shared structure of feeling that shapes how communities engage with energy infrastructures and their contradictions.

Materiality offers a complementary perspective. The so-called ‘new materialist’ turn (Coole & Frost, 2010; Bennett, 2010) insists that matter is not inert but agential, actively shaping human and nonhuman relations. Serenella Iovino and Serpil Oppermann’s *Material Ecocriticism* (2014) extends this insight to texts, describing them as ‘material narratives’ inscribed with the agencies of landscapes, infrastructures, and nonhuman actors. As they argue:

Matter is not a passive substance waiting to be used or signified, but a storied materiality that embodies and transmits meanings, inscriptions, and narratives. Every natural element or body is a text in which stories are written and through which stories can be read (Iovino & Oppermann, 2014, p. 1).

For energy studies, this perspective underscores that coal seams, steam engines, and nuclear repositories are not simply backdrops to human stories; they are constitutive of them. Dominic Boyer’s (2019) ethnography of electricity in Mexico, for instance, shows how infrastructures condition rhythms of everyday life, speaking most forcefully when they break down. Similarly, Andreas Malm (2016) traces how coal’s specific properties—abundant, combustible, transportable—shaped the logic of capitalist industrialisation.

Yet affect and materiality must be read in tandem. The cultural absorption of thermodynamics, for example, was not only a set of intellectual doctrines but a felt experience: coal dust in lungs, stoppages in mills, hunger in households. Affect articulates the ambivalence of these experiences, while material analysis situates them in infrastructures and resources. Berlant’s framework of cruel optimism clarifies why such attachments persist, even when recognised as harmful. Fossil fuels provide continuity, work, and meaning, yet they foreclose other futures. Cotton Famine poetry and contemporary theatre both dramatise this paradox, showing how energy imaginaries are sustained by attachments that are as affective as they are material.

By weaving together affect and materiality, my project demonstrates that energy imaginaries cannot be understood through symbolic form or lived experience in isolation. They emerge in the interplay of cultural repertoires, embodied testimony, and infrastructural environments. In the Cotton Famine poems, coal is simultaneously a metaphor of providence, a material substance shaping bodily endurance, and an affective register of bitterness and hope. In contemporary theatre, nuclear futures are staged through narrative temporalities that merge dramaturgical tension with embodied audience participation, generating affective knowledge beyond the reach of policy reports. In interviews, residents articulate attachments to energy infrastructures through metaphors of inheritance and risk, linking local experience to global energy transitions. This integrative approach contributes to scholarship in several ways. It extends Berlant's theorisation of cruel optimism into historical archives, demonstrating how fossil-fuelled attachments were lived and contested long before the climate crisis. It grounds Iovino and Oppermann's material ecocriticism in socio-technical contexts, showing how infrastructures inscribe themselves into cultural texts. And it advances Szeman's (2017) argument that energy humanities must account for cultural attachments by demonstrating how those attachments operate affectively and materially, not only discursively. By foregrounding affect and materiality alongside narrative, this project contributes a historically grounded, regionally situated account of energy imaginaries. It shows how they are produced, circulated, and contested across text, performance, and testimony. And it highlights the central paradox of fossil-fuelled modernity: that the very infrastructures and materials that sustain life are often the obstacles to imagining sustainable futures.

If narratives provide the structures through which energy imaginaries are articulated, affect and materiality supply the textures that make those imaginaries felt. Affect theory, as articulated by Massumi (2002) and Clough (2007), shifts attention from individuated emotion to the pre-conscious intensities that circulate among bodies, infrastructures, and environments. Ahmed

(2004) extends this by showing how emotions ‘stick’ to objects and histories, creating orientations toward the world that are as social as they are personal. In the context of energy, this means that coal dust, the smell of petrol, or the hum of turbines are not neutral sensory experiences but affective registers through which attachments and anxieties are shaped.

Such insights align with the work of New Materialist scholars who challenge the passivity of matter. Bennett (2010) insists on the ‘vitality’ of materials, while Coole and Frost (2010) emphasise how matter and meaning are dynamically co-constituted. Barad’s concept of ‘intra-action’ (2003) is particularly resonant here, suggesting that energy infrastructures and human subjects do not pre-exist their relations but emerge through them. These perspectives converge in Puig de la Bellacasa’s (2017) insistence that material entanglements are also ethical entanglement, ‘matters of care’ that demand attention to responsibility and vulnerability.

Affect and materiality are not abstract categories in this project but central to how communities in Lancashire and Cumbria live with energy infrastructures. Across both the plays and the interviews, narratives highlighted the health implications of nuclear industries, the environmental degradation of surrounding landscapes, and the haunting temporalities of waste and contamination. These accounts repeatedly evoked the nuclear sublime, where vast scales of risk and ruin are rendered palpable through embodied experience and cultural form. These sensations crystallise the uneven distribution of energy’s costs and benefits, and they shape the temporalities through which futures are imagined, compressing time into anxious presents or stretching it into speculative horizons. In literary and theatrical texts, similar dynamics are staged through metaphor and form: the Cotton Famine poetry links coal to endurance and moral discipline, while contemporary plays dramatise nuclear waste as both an uncanny presence and a generational inheritance.

Affect theory is indispensable here because it explains how attachments to energy persist even when their harms are known. Berlant’s (2011) notion of ‘cruel optimism’ captures the paradox

of clinging to energy systems that promise comfort or security while perpetuating ecological destruction. Bladow and Ladino's (2018) work on affective ecocriticism develops this further, demonstrating how feelings of loss, hope, and disillusionment circulate in environmental narratives. In my materials, these attachments are evident in both historical and contemporary forms: poetry that celebrates resilience in the face of deprivation, theatre that stages ambivalence toward technological promises, and testimonies that oscillate between nostalgia for industrial stability and apprehension about uncertain futures.

Ingold's (2012) call to understand materials through their histories underscores this point. Energy materials are not inert but carry stories, of extraction, combustion, waste, and renewal, that inscribe themselves into landscapes and bodies. Iovino and Oppermann (2014) describe this as the 'storied matter' of ecocriticism, where materiality is itself a narrative agent. My project builds on these insights by demonstrating how coal, nuclear waste, and renewable infrastructures function both as physical forces and as narrative figures, shaping imaginaries of endurance, risk, and transition.

By foregrounding affect and materiality alongside narrative, this thesis develops a framework attentive to the embodied, emotional, and ethical dimensions of energy imaginaries. This is not an addendum to narrative analysis but its necessary complement: stories of energy gain their force not only from symbolic repertoires but from the visceral intensities and material agencies through which energy is lived. In this sense, affect and materiality provide the connective tissue between personal experience, cultural form, and sociotechnical imaginaries, binding together the textual, the ethnographic, and the infrastructural strands of the project.

### 1.5 Interdisciplinarity and Transdisciplinarity

The Environmental Humanities has long insisted on the necessity of interdisciplinarity, yet its practice has proven far more complicated than its rhetoric. Barry, Born, and Weszkalnys (2008)

caution that many projects remain forms of ‘accounting’ or ‘parallel play,’ where disciplines work side by side without genuine epistemic transformation. MacLeod and Nagatsu (2018), writing from the perspective of environmental research, similarly argue that interdisciplinarity often reproduces disciplinary silos, with participants reverting to established norms of interpretation, empiricism, or modelling rather than developing integrative frameworks. These critiques are particularly relevant to energy scholarship, where collaborations frequently default either to technocratic social science or to interpretive cultural analysis, with little sustained attempt to bridge them.

For this reason, many scholars advocate transdisciplinarity as a more ambitious orientation. Boix Mansilla and Gardner (2006) define it as inquiry that not only synthesises disciplinary perspectives but reconfigures the boundaries between them. Lang et al (2012) systematise transdisciplinary sustainability research around joint problem-framing, iterative integration, and reflexivity—principles designed to resist the compartmentalisation of expertise. Yet even here, critics note that ‘transdisciplinarity’ is often invoked aspirationally rather than enacted (Jahn, Bergmann, & Keil, 2012). It risks becoming a buzzword unless methodological innovation is matched by institutional and epistemic commitments that genuinely reconfigure relations among disciplines, practitioners, and publics.

In the Energy Humanities, these tensions are visible in two dominant tendencies. On the one hand, close reading and theoretical critique (central to the humanities) can yield rich insights into energy’s symbolic and historical dimensions but risk abstraction from lived practice. On the other hand, sociotechnical frameworks adapted from Science and Technology Studies provide analytical power but often downplay cultural texts, narrative forms, and affective registers. As Szeman (2017) acknowledges, the Energy Humanities has at times privileged conceptual interventions over grounded empirical engagements, while Jenkins (2018) argues

that without attention to lived experiences and local cultures, such work risks reproducing the very technocratic framings it seeks to critique.

I position this thesis in response to those debates. Rather than alternating between textual analysis, ethnographic testimony, and STS concepts, I treat them as mutually constitutive modes of inquiry. Archival poetry, contemporary theatre, interviews with cultural producers, and community testimonies are not framed as separate data sets but as interlinked sites where imaginaries of energy are produced, circulated, and contested. This integrative design models the kind of epistemic reconfiguration that transdisciplinarity demands, resisting the pull of disciplinary comfort zones and demonstrating what it looks like to sustain dialogue across interpretive, empirical, and conceptual registers.

Such an approach also responds to wider demands that the humanities demonstrate relevance to pressing planetary concerns. Sovacool and Dworkin (2015) stress that energy justice requires attention to voices and narratives excluded from policy discourse, while Lieberknecht et al. (2022) call for research designs that incorporate experiential knowledge alongside academic expertise. By grounding its analysis in the cultural forms and lived narratives of Northwest England, this thesis exemplifies how humanities methods can be brought into dialogue with broader socio-technical debates, not as ornamental commentary but as critical to understanding how energy transitions are imagined, contested, and inhabited.

In short, while interdisciplinarity is frequently invoked across environmental scholarship, relatively few projects enact the integrative ethos they celebrate. By weaving together literary, performative, ethnographic, and STS-informed approaches, this thesis demonstrates one way of practising transdisciplinarity in the Energy Humanities: not as a slogan, but as a methodological commitment to reconfigure knowledge production around the complexity of energy transitions.

## 1.6 Policy relevance and societal impact

Debates about energy transitions have too often been dominated by technocratic and policy-oriented framings centred on efficiency, security, and cost-effectiveness. Stirling (2014) critiques this orientation as a dangerous narrowing of imagination, warning that expert-driven approaches privilege managerial logics while marginalising the plurality of cultural, ethical, and social perspectives that shape how communities live with energy. Similarly, Sovacool and Dworkin (2015) argue that energy justice cannot be achieved through technical or economic metrics alone. Questions of distribution, recognition, and participation must be foregrounded, since transitions unfold in ways that affect not only material infrastructures but also community identities, cultural values, and lived experience.

Research in energy and climate governance has underscored how imaginaries underpin public legitimacy. Chilvers and Pallett (2018) show that energy policy is not neutral but framed by competing visions of publics and participation, in which ‘the public’ is often imagined as a passive object to be managed rather than an active subject of decision-making. Healy and Barry (2017) extend this critique by arguing that transitions should be understood as contested political processes, rather than as technocratic pathways toward an assumed consensus around ‘green growth.’ These contributions expose the limits of policy discourses that present energy futures as self-evident or inevitable, masking the conflicts and exclusions they entail.

Within this landscape, the humanities play a crucial but underacknowledged role. Szeman (2019) insists that Energy Humanities must demonstrate not only interpretive sophistication but also societal relevance by engaging with how cultural forms register and contest the lived consequences of energy regimes. Wenzel (2019) similarly highlights how world literature provides insight into climate crisis as a shared but uneven predicament, an argument that extends to vernacular and regional cultural production, where the everyday textures of energy dependency and contestation are made visible. Scholars such as Jenkins et al. (2018) and Burke

and Stephens (2018) likewise stress that energy democracy cannot be separated from cultural imaginaries that shape what futures are deemed possible or desirable.

This thesis contributes to these debates by analysing how non-elite cultural forms, working-class poetry, participatory theatre, and community testimony, surface imaginaries that challenge technocratic framings of energy. Whereas policy discourse abstracts energy into metrics of supply and demand, these cultural narratives reveal the affective and ethical stakes of infrastructures: the nostalgia attached to industrial labour, the unease generated by nuclear dependence, the contested hopes invested in renewable energy. Such narratives do not merely mirror public opinion but actively participate in shaping horizons of possibility, demonstrating how cultural forms intervene in the politics of legitimacy and justice.

By situating regional cultural production at the centre of debates on energy governance, this project demonstrates the broader societal and policy relevance of humanities scholarship. It shows that artistic and vernacular imaginaries are not peripheral commentary but constitutive of how energy transitions are lived, contested, and legitimised. In so doing, the thesis not only extends the remit of Energy Humanities but also models how humanities research can intervene in public and policy debates at a moment of ecological urgency, making visible dimensions of justice, affect, and belonging that would otherwise remain unaccounted for in technocratic models.

Taken together, the bodies of work surveyed here demonstrate both the vitality and the incompleteness of current scholarship on energy and culture. Foundational studies in the Energy Humanities have revealed how energy regimes saturate politics, aesthetics, and everyday life, while narrative and performance theory highlight the symbolic, affective, and embodied dimensions of these entanglements. Scholarship on sociotechnical imaginaries and energy governance underscores the political stakes of how futures are envisioned, while debates on interdisciplinarity and policy relevance insist on the need for integrative and socially responsive

approaches. Yet across these fields, important gaps remain. As I argue above, Energy Humanities has tended to privilege either large-scale cultural forms or abstract policy debates, leaving regional and vernacular imaginaries underexplored. Narrative theory has illuminated textual and ethnographic practices but rarely integrated the two. Interdisciplinarity is widely invoked but too often enacted as juxtaposition rather than methodological synthesis.

This thesis addresses these lacunae by developing a transdisciplinary framework that brings archival poetry, contemporary theatre, ethnographic interviews, and community testimony into sustained dialogue. By tracing how imaginaries are articulated across historical and contemporary cultural forms, the project demonstrates the persistence and transformation of energy attachments in Northwest England. In doing so, it contributes to Energy Humanities not simply by expanding the archive but by modelling an approach that integrates literary analysis, performance studies, ethnography, and Science and Technology Studies. At stake is not only a richer understanding of how communities imagine energy but also a demonstration of how humanities scholarship can intervene in debates about justice, legitimacy, and transition at a moment of ecological urgency.

### Key Terminology Explained

*Energy materialities*: The way I use this term refers to the entanglement of the material with the social (de Wolff, 2018), or the meaning we assign to the material when it enters the realm of culture, either as an artefact, a text, or a representation. The ending ‘ty’ or ‘ties’ evokes also an agentic force, the capacity of the material to inscribe itself onto human assemblages by bringing together diverse actors and create a multiplicity of narratives. In her research in the North Pacific Ocean, on the Big Island, Hawaii, ethnographer Kim de Wolff (2018)

explores Kamilo, a beach covered in plastic and other human-made debris, along with natural waste, in order to ‘exemplify the capacities of nonhumans to collect, display and transform human materials, in this case plastic waste on and as sand’. This iteration of a materiality resonates particularly with my own research, as I explore not only the assemblages energy creates with human actors, but also what residues, energy waste, and technologies mean about the future.

*Thermodynamic Ethics:* This concept is a framework that combines principles from thermodynamics with ethical considerations regarding energy use and its broader impacts. It challenges the view of energy as a neutral resource, emphasising its moral implications, especially regarding environmental justice, social inequalities, and sustainability. This approach calls for ethical reflection on how energy systems affect society and the environment, advocating for equitable access to energy and the fair distribution of environmental costs (Knight, 2017). It also highlights the need to consider the long-term consequences of energy practices on future generations (Schlosberg, 2007). By integrating cultural, social, and environmental factors, thermodynamic ethics encourages more holistic approaches to energy research and policy, promoting sustainable and just energy transitions (Jenkins, McCauley & Heffron, 2016; Sovacool, 2014).

*Affect:* I would like to unpack the way I use notions of time and affect at this point, or what has been dubbed in various theoretical works as ‘affective temporalities’, towards getting a better understanding of what kind of emotions are entangled with energy materials. The conceptualisation of affect I reiterate in my research is indebted to Patricia T. Clough (2007) whose theorisation is based on the work of Gilles Deleuze and Félix Guattari (1987), Baruch Spinoza (1677/2002) and Henri Bergson (1907/1968). In this model, affect is conceived as a force emanating from the body in its pre-individual state. I intend to approach notions of affect

as an extrapolation of socially bound expressions of emotion, a communal response to entanglements of bodies with matter and technologies. Clough argues for the ‘affective turn’ in cultural studies, ‘The turn to affect points instead to a dynamism immanent to bodily matter and matter generally - matter’s capacity for self-organisation in being informational - which, I want to argue, may be the most provocative and enduring contribution of the affective turn’ (Clough, 2008, p. 207). I explore affect as the cumulative response of bodies to a certain condition bound by a certain temporality, which emanates from body to body and is captured in cultural artefacts. According to Brian Massumi, affect is the social expression of feelings, felt from a body of bodies and potentially create dissonance, as affect is ‘open-endedly social’ (Massumi, 2002). Tracing temporalities (the different ways of experiencing time and the feelings invoked in a specific situation or crisis) and how these are felt (affect) can potentially reveal a means for dislocating certain assumptions about the linearity of future temporalities (McManus, 2006). Experiencing energy materialities, be it in the form of the sensorial experience of fuel (smell) or pinning all hopes for a better future on energy infrastructure and resources projects, creates assemblages of past, present and future temporalities along with hope, disillusionment, ambition, and political discourses (Knight and Stewart, 2016).

*Energy regimes:* I use the term energy regimes to talk about what happens when an energy source enters the realm of the social, in the way it brings together different actors both human and non-human and pertains to the cultural artefacts that emerge from that entanglement. For anthropologist Bruce Podobnik, an energy regime ‘refers to the network of industrial sectors that evolve around a particular energy resource, as well as the political, commercial, and social interactions that foster [its] expanded production and consumption’ (1999, p.155). My analysis starts in the long 19<sup>th</sup> century and the ‘coal panics’ that swept Britain, focusing on a body of poetry that has not been given a great amount of attention, the Cotton Famine poetry, which acts as an instance of exigence. In the iterations of the present time, the energy regimes I

examine include nuclear energy and waste management of nuclear materials, and the social interactions in the Lancashire area with participants on social media and in the form of semi-structured interviews.

### Research Questions

Having established the conceptual scaffolding of this thesis, the next step is to translate these theoretical orientations into operational questions that can guide empirical and textual analysis. Thermodynamic ethics, sociotechnical imaginaries, and new materialism each illuminate different dimensions of how energy is narrated, contested, and embodied. Yet their value lies not in abstract theorisation alone, but in the ways they can be mobilised to interrogate specific cultural forms and lived practices in Lancashire and Cumbria. To move from theory to method, it is necessary to articulate the research questions that anchor this project: questions that capture the ethical logics of thermodynamic reasoning, the collective visions and counter-visions of sociotechnical imaginaries, and the material agency of energy infrastructures as they are registered in poetry, theatre, and testimony. These questions form the bridge between the conceptual frameworks outlined above and the methodological strategies detailed in the following chapters, ensuring that the analysis remains grounded, critical, and responsive to the complexity of energy as both a material system and a cultural imaginary.

This thesis is guided by one overarching question:

How do cultural narratives and practices in Lancashire and Cumbria articulate attachments to energy materials and thermodynamic processes, and what does this reveal about the imaginaries that shape energy futures?

From this central concern emerge four interrelated lines of inquiry.

The first addresses the ways in which narratives about energy materials, whether overt or implicit, disclose forms of attachment to thermodynamic processes. I ask how such narratives complicate, extend, or challenge the conceptual scope of the Energy Humanities. This question underpins the analysis of nineteenth-century Cotton Famine poetry, which illustrates how working-class cultural production articulated moral, material, and affective attachments to energy regimes at a moment of industrial crisis.

A second line of inquiry considers how energy systems shape both environmental conditions and social relations, and how these dynamics become visible in cultural production. This question is taken up in the chapters on contemporary theatre, where performance is read as a medium that stages the environmental and social consequences of energy infrastructures, and in interviews with playwrights and artists, which provide reflexive accounts of how cultural producers conceptualise the role of their work in shaping public imaginaries.

The third question takes a transhistorical perspective. I explore why cultural forms remain persistently attached to fossil fuels, even in the face of mounting awareness of their environmental consequences. This concern animates the comparative movement of the thesis: from nineteenth-century poetry through to twenty-first-century theatre and to the voices of

stakeholders and community activists, whose testimonies reveal the continuities and ruptures in how energy futures are imagined.

Finally, a fourth line of enquiry focuses on scale. I investigate how the cultural dimensions of energy materials shift across temporal registers, and how these shifts are produced or complicated by the distinctive characteristics of particular energy forms themselves. This line of questioning is pursued in the analysis of Cumbrian Alchemy, where materials are mobilised not only as objects of representation but as active participants in the co-production of imaginaries.

Together, these questions structure the thesis as a transhistorical investigation. They link nineteenth-century poetic responses to industrial crisis with contemporary theatre, activism, and art, demonstrating how imaginaries of energy endure, mutate, and acquire new resonances across genres, communities, and historical moments.

## Methods Overview

These questions provide the scaffolding for the methodological design of the thesis. They are pursued through a transdisciplinary combination of archival literary analysis, theatre analysis, narrative interviewing, and reflexive field engagements. Each method is chosen for its capacity to illuminate a particular dimension of the questions: archival poetry to historicise attachments, theatre to dramatise imaginaries in performance, interviews to foreground lived and situated knowledge, and fieldwork to capture infrastructures as environments of everyday life.

Analytical strategies of close reading, narrative analysis, and comparative synthesis allow insights to be traced across materials without collapsing their differences.

In this way, the research questions and methods are not discrete elements but mutually reinforcing. The questions specify the object of enquiry; the methods provide the means of pursuing them across genres, temporalities, and communities. Together they enact the transdisciplinary orientation of the thesis, ensuring that the analysis addresses energy imaginaries as ethical, cultural, and material phenomena.

To address these research questions, the thesis adopts a multi-sited, transdisciplinary methodology. Rather than treating each method in isolation, the design emphasises how different approaches collectively contribute to the integrated analysis of sociotechnical imaginaries. The project moves across archival, performative, ethnographic, and creative sites, demonstrating how imaginaries are produced, circulated, and transformed in different cultural registers and at different temporal scales.

The first component of the methodology is archival literary analysis of Cotton Famine poetry, which situates imaginaries within the industrial and thermodynamic logics of the nineteenth century. These texts provide insight into how working-class communities articulated attachments between labour, morality, and energy at a time of profound infrastructural crisis. The analysis establishes a *longue durée* genealogy of energy imaginaries, creating a historical context against which contemporary articulations can be read.

The second methodological strand turns to contemporary theatre, analysed through literary-critical tools rather than dramaturgical theory. Theatre is approached as a cultural form that

stages energy imaginaries in public, affective, and accessible ways. Scripts and performances become texts through which infrastructural debates are mediated, contested, and made legible to broader audiences.

Building on this, the thesis incorporates interviews with playwrights and artists, which provide a reflexive dimension to the analysis. These conversations reveal how cultural producers themselves verbally portray their own imaginative engagement with energy futures and conceptualise the role of artistic practice in shaping public discourse. In this way, the interviews extend textual analysis into a consideration of creative intention and self-understanding.

A further dimension of the methodology involves interviews with community members, activists, and stakeholders in Lancashire and Cumbria. These testimonies document how imaginaries are articulated and negotiated in lived practice, particularly in contexts of infrastructural struggle and policy debate. They demonstrate how attachments to energy materials are experienced in everyday life and how such experiences shape collective imaginaries of the future.

Finally, the thesis analyses a collaborative art project, Cumbrian Alchemy, read alongside an interview with its creator. This case study foregrounds how imaginaries are not only represented but actively co-produced through artistic engagement with materials. Here, the project adopts the insights of research-creation, treating artistic practice as a site of knowledge production rather than as an object of interpretation alone.

The rationale for combining these methods is twofold. First, it enables imaginaries to be traced across temporal scales: from nineteenth-century cultural responses to industrialisation through

to contemporary artistic and activist practices. Second, it makes possible the analysis of imaginaries across cultural registers: from textual and aesthetic representations to lived experiences and co-produced artistic interventions. Each method contributes a perspective that would be insufficient on its own. Narrative studies exposes the vicissitudes of representation, i.e. questions of discursive and affective impact, modes of dissemination and generic framings, but it does not allow one to reach through the layers of representation to question protagonists or authors; ethnography can document lived practices but cannot trace their deeper cultural genealogies; Science and Technology Studies can theorise imaginaries but risks abstraction if not grounded in aesthetic and material forms. By integrating these perspectives, the thesis demonstrates how imaginaries of energy emerge at the intersection of historical memory, cultural production, lived experience, and material practice.

This methodological synthesis directly addresses the gaps identified in existing scholarship. Energy Humanities has tended to focus on large-scale cultural forms and global narratives (Szeman & Boyer, 2017; LeMenager, 2014), leaving regional cultural production comparatively underexplored. Likewise, work on sociotechnical imaginaries (Jasanoff & Kim, 2015) has concentrated on national policy and governance, with little attention to localised artistic and community articulations. By combining historical texts, contemporary performances, lived testimonies, and collaborative art practice, this thesis grounds the analysis of energy imaginaries in a specific regional context (Lancashire and Cumbria) while situating it within broader debates about energy transitions.

At the same time, the design foregrounds the necessity of moving beyond methodological pluralism. The integration of narrative, ethnographic, and STS-informed approaches is not an optional embellishment but a requirement of the research problem itself. Energy imaginaries

operate simultaneously through texts, performances, bodies, and infrastructures; they cannot be captured adequately by a single disciplinary lens. This thesis insists on methodological integration, by bringing archival, performative, and ethnographic materials into sustained dialogue around a shared object, the sociotechnical imaginaries of energy, rather than analysed as discrete case studies. In this way, I aspire to the form of knowledge production that Mansilla and Gardner (2006) and Lang et al. (2012) describe as transdisciplinary: an orientation that does not merely combine disciplines but actively reconfigures their boundaries to generate insights attentive to complexity, context, and the entanglement of epistemic cultures.

Positioned in this way, the methodological framework of the thesis not only addresses gaps in Energy Humanities and STS but also models the kind of integrative scholarship increasingly recognised as essential for grappling with ‘wicked problems’ such as energy transitions.

### Positioning and Original Contribution

I situate this thesis at the intersection of Energy Humanities, Science and Technology Studies (STS), and narrative inquiry, advancing an approach that is at once regional in focus and transdisciplinary in method. Energy Humanities has established the centrality of energy to culture, yet much of its archive has gravitated toward metropolitan, global, or canonical forms such as the novel and film (Wenzel, 2019; Szeman & Boyer, 2017). While such analyses have generated powerful insights, they risk overlooking how energy imaginaries are formed and contested in non-elite and regional contexts. This thesis takes a different path: it foregrounds nineteenth-century working-class poetry, contemporary participatory theatre, and community

testimony in Northwest England as sites where attachments to energy regimes are articulated, remembered, and reimagined. In doing so, it responds directly to Macdonald's (2013) call to attend to 'vernacular energies' and contributes to diversifying the field's archive by demonstrating that cultural negotiations of energy extend far beyond metropolitan or elite cultural production.

Sociotechnical imaginaries scholarship has shown how states and institutions mobilise visions of desirable futures (Jasanoff & Kim, 2015; Chilvers & Pallett, 2018; Turnhout et al., 2020). Yet by privileging governance and policy, this body of work often sidelines how imaginaries are also lived and reconfigured through everyday cultural practice. My project extends the framework to poetry, theatre, and community narratives, showing how imaginaries are not only 'institutionally stabilised' but also fragile, affectively charged, and regionally situated. This reframing demonstrates that imaginaries are simultaneously political and aesthetic projects, produced across institutional, cultural, and experiential registers. By situating imaginaries in the lived contexts of Lancashire and Cumbria, the thesis also resists the metropolitan bias of much existing research, emphasising how peripheral or 'provincial' contexts are central to the cultural politics of energy.

Methodologically, the thesis addresses a long-recognised challenge. As Jenkins (2018) observes, Energy Humanities has struggled to integrate the interpretive depth of narrative studies with the empirical engagement characteristic of the social sciences. Narrative theory and affect studies remain underutilised in energy research, while ethnographic methods are seldom brought into dialogue with literary and performance analysis. This thesis tackles these disjunctions directly. By mobilising archival, literary-critical, performative, and ethnographic methods around a shared object, the sociotechnical imaginaries of energy, it models what

genuinely transdisciplinary inquiry can look like. The structure of the thesis enacts this commitment: Chapter 1 establishes historical depth through working-class poetry; Chapter 2 analyses contemporary theatre as a medium of ecological speculation; Chapter 3 incorporates practitioners' reflexive perspectives; and Chapter 4 turns to community narratives to capture lived engagements with infrastructures. Each chapter foregrounds a different register of cultural production, yet their sequencing demonstrates integration rather than simple juxtaposition, producing a cumulative, layered analysis in which insights build across domains rather than remaining siloed.

The project also intervenes in debates about the societal relevance of the humanities. As Stirling (2014) and Sovacool and Dworkin (2015) argue, energy transitions cannot be reduced to questions of efficiency, cost, or security; they are cultural and ethical struggles over how futures are imagined and legitimised. By examining narratives that surface the affective and ethical stakes of energy systems, from nostalgia for industrial labour to unease about nuclear waste and contested hopes for renewable energy, this thesis demonstrates that cultural forms are not peripheral to policy but central to how energy transitions are understood and negotiated. In this respect, it contributes to the case for the humanities as indispensable to the climate debate, not as a supplement to technical expertise but as a mode of inquiry that reveals dimensions of energy transition that are otherwise obscured.

Taken together, the contributions of the thesis can be summarised on three levels:

1. Empirical: expanding the archive of Energy Humanities by analysing regional, working-class, and participatory cultural forms in Northwest England.

2. Theoretical: extending the concept of sociotechnical imaginaries into cultural and affective domains, showing how imaginaries operate beyond governance and policy.
3. Methodological: modelling a transdisciplinary approach that integrates narrative analysis, ethnography, performance studies, and STS to capture the cultural and material complexity of energy transitions.

Positioned in this way, the thesis makes both a substantive and a methodological intervention. Substantively, it demonstrates that imaginaries of energy are generated in historical, artistic, and everyday contexts that have been underrepresented in the field. Methodologically, it exemplifies how the humanities can combine with social science and STS approaches to produce analyses adequate to the complexity of energy as a cultural, material, and political phenomenon. As the chapters that follow demonstrate, tracing imaginaries across poetry, theatre, and lived testimony is not simply an eclectic choice but a necessary strategy for revealing how energy is imagined, contested, and inhabited across time and scale.

In doing so, the thesis not only enriches Energy Humanities and Environmental Humanities but also demonstrates the societal relevance of the humanities to contemporary debates about energy, justice, and the climate emergency.

## Chapter Outline

## Thesis Organisation-A Genealogy of Crises

The organisation of the thesis mirrors both the conceptual trajectory and the regional grounding of the research. All of the cultural forms analysed—poetry, theatre, interviews, and community testimonies—emerge from Northwest England, a region repeatedly marked by moments of energy crisis. Lancashire, Cumbria, and Manchester are not merely settings for cultural production but crucibles in which energy imaginaries have historically been forged, re-forged, and contested. By structuring the chapters around materials from this shared geography, the thesis demonstrates how imaginaries of energy travel across time, how they crystallise in particular forms of crisis, and how they are continuously reworked in artistic and everyday practices.

The chapters move across temporal scales and cultural registers, beginning with nineteenth-century poetry and culminating in contemporary community narratives. This progression allows energy imaginaries to be traced genealogically while emphasising their rootedness in place. The structure reflects the project's transdisciplinary orientation: rather than compartmentalising different kinds of material, it situates them in dialogue to illuminate the layered ways in which energy systems become culturally meaningful in Northwest England.

Chapter 1 examines Cotton Famine poetry (1861–65) as a cultural manifestation of early fossil-fuelled industrialisation. Written largely by working-class authors and published in Lancashire newspapers, these poems reveal how coal was embedded not only in the political economy of the mills but also in the moral and affective landscapes of daily life. They register the impact of the Union blockade during the American Civil War, which abruptly severed cotton supplies and brought industrial production to a halt. In this moment, workers articulated solidarities with enslaved African Americans even as they faced hunger and unemployment at home. The poems document how a regional community confronted a global energy and materials crisis,

embedding moral vocabularies of providence, thrift, and endurance into the experience of stoppage. This chapter situates present-day imaginaries against this genealogy, showing how the earliest articulations of energy ethics in the region were inseparable from crisis and contestation.

Chapter 2 turns to contemporary plays produced in Northwest England, which dramatise nuclear power, fracking, and renewable energy within the discourse of the ‘Energy Coast.’ These works are written in the shadow of another regional crisis: the transition from coal and textile industries to uncertain futures structured by nuclear storage, contested shale gas projects, and fragile renewable initiatives. Just as Cotton Famine poetry mediated the social upheaval of the 1860s, these plays grapple with the insecurities of post-industrial energy landscapes. They stage anxieties about ecological collapse, intergenerational responsibility, and speculative futures, foregrounding the dilemmas of a region once again caught between dependence on energy infrastructures and the risks of transition. Here, the concept of sociotechnical imaginaries is central: theatre becomes a medium for interrogating official narratives of energy security while offering experimental visions of what futures might yet be possible.

Chapter 3 engages directly with creative practitioners through narrative interviews with playwrights and artists. Building on the textual analyses of Chapter 2, this chapter foregrounds how cultural producers conceptualise energy ethics, temporalities, and material entanglements. Their testimonies provide insight into the reflexive dimension of cultural production: how creators understand the role of art in shaping public imaginaries, and how their perspectives extend or complicate the narratives embedded in their works. Importantly, these interviews further situate artistic practice within the historical and material conditions of Northwest England, underscoring how a region shaped by coal, nuclear, and wind continues to act as a proving ground for cultural reflection on energy.

Chapter 4 shifts the focus outward to residents and community stakeholders living near energy infrastructures. Drawing on ethnographic interviews and field observations, this chapter examines how imaginaries emerge in everyday encounters with energy regimes. Whether discussing the legacy of coal, the risks of nuclear waste, or the contested presence of such infrastructures, participants narrate their attachments through affective registers of anxiety, resignation, nostalgia, and pragmatic hope. These lived narratives converge with and diverge from the cultural texts examined earlier, demonstrating how communities in Northwest England negotiate the contradictions of energy transition at a visceral and embodied level. As in the Cotton Famine, crisis is experienced not only as economic disruption but as a moral and affective burden borne by communities situated within global systems of extraction and circulation.

The Conclusion revisits the research questions and synthesises findings across the chapters, reflecting on how imaginaries of energy are produced, circulated, and contested across textual, performative, and lived registers. It outlines the theoretical contributions of the thesis, particularly in extending thermodynamic ethics into vernacular cultural forms, reframing sociotechnical imaginaries through regional analysis, and integrating narrative and affective approaches. It also highlights methodological innovations, including the combination of literary close reading with ethnographic and narrative inquiry. Finally, the conclusion considers the study's limitations and proposes directions for future research, with particular emphasis on incorporating non-Western perspectives and expanding transdisciplinary collaborations in Energy Humanities.

Taken together, the structure underscores the central argument: that Northwest England has been repeatedly forced to navigate the disruptions of energy crisis, from the stoppages of the Cotton Famine to the precarious futures of the Energy Coast. By moving from poetry to theatre, from

artistic reflection to community testimony, the thesis demonstrates how imaginaries of energy are always mediated through regional experience, yet also shaped by global flows of fuel, capital, and crisis. This genealogy reveals not only how energy systems are represented but how they are lived and contested, embedding the history of a specific place into broader debates about energy transition and environmental justice.

*Chapter One: Tracing a fossil-fuelled historicity: The laws of Thermodynamics and the Cotton Famine Poetry*

Cotton Famine Poetry, Industrial Crisis, and Energy: Contexts and Archives (1861-1865)

This chapter examines how working-class poetry published during the Lancashire Cotton Famine (1861–1865) mediated the social, material, and energetic transformations of early fossil-fuelled industrialisation. The Cotton Famine, precipitated by the Union blockade during the American Civil War and supercharged by existing overproduction in the mills, threw almost half a million textile workers in Lancashire out of work. In this conjuncture, regional newspapers became key sites of cultural production. Columns and supplements opened to ‘factory verse,’ dialect poems, broadsides, and songs that registered hunger, relief, labour discipline, abolitionist solidarities, and the infrastructures of steam and coal. The poems I analyse here derive from that press ecology and from subsequent anthologies and digital recoveries (e.g. Victorian newspaper archives; Hitchman & Hitchman, 1997; the Cotton Famine Poetry project led by Simon Rennie). They offer not a marginal commentary but a primary record of how energy systems were lived, narrated, and contested on the shop floor and in the street.

Placing these poems first establishes the historical ground against which the rest of the thesis reads contemporary imaginaries in theatre and community testimony. The mid-nineteenth century was not only an era of mechanisation; it was an era of coal temporality; factory time, nocturnal labour under gaslight, the regularisation of work by the steam engine’s cadence, and the reorganisation of life around fuel logistics. These conditions enter the poems as imagery (smoke, engines, furnaces), as dialect and rhythm (work-rhymes, marching metres), and as

ethical argument (desert, providence, thrift, mutual aid). They also anchor a politics: sympathy with enslaved labour in the United States despite acute local deprivation; suspicion of mill-owners' speculative practices; and ambivalence toward the very machines on which livelihoods depended.

Form matters here. Printed verse in the local press functioned as low-cost public media: it circulated quickly, invited response, and stitched readers into a vernacular public sphere. The poems' addressivity (to neighbours, overseers, councils, chapel congregations) and their recurring 'topoi' (coal, engines, warehouses, charity, bread) make them unusually sensitive instruments for tracking how industrial infrastructures were translated into feeling; melancholia, endurance, bitterness, pragmatic hope. In short, Cotton Famine poetry is a privileged archive for studying energy attachments before 'energy' was a named field.

To grasp the full significance of this cultural archive, it is necessary to situate the poetry within the wider intellectual atmosphere of the 1860s, when the emergent laws of thermodynamics were being diffused beyond scientific circles into everyday moral and religious discourse. Public lectures, popular magazines, and pulpit sermons translated their language of conservation and dissipation into idioms accessible to artisans and working readers (Choi, 2007; Smith, 1998; Franchetti, 2021). The first law of thermodynamics, which held that energy could be transformed but never destroyed, invited optimistic readings: a reassurance of continuity amidst economic upheaval. The second law, by contrast, introduced the troubling concept of entropy, which implied irretrievable waste and decline. William Thomson's 1852 essay in *Macmillan's Magazine* famously warned of a cosmic 'heat death,' a vision that immediately invited eschatological analogy (Thomson, 1852). Crosbie Smith (1998) shows how these discoveries resonated particularly in northern Britain, where moderate Presbyterianism framed energy conservation as providential order and dissipation as moral failure, a middle ground

between biblical revivalism and evolutionary materialism. As Daggett (2018, p. 104) puts it, ‘the science of energy became the authoritative basis of the rejuvenation of the church for the industrial era.’

These ideas were not confined to elite science. As Franchetti (2021) notes, the popular press became a key vehicle of cultural absorption, embedding thermodynamic principles in moral instructions about work, thrift, and restraint. In this way, the same newspapers that carried dialect poems also carried reports of energy science, sermons on waste, and discussions of productivity, ensuring that working-class readers encountered these logics in multiple registers.

The cosmological dimension of the second law intensified this moral force. Nielsen (2018) shows how the sun itself became a focus of anxiety: life-bearing but finite, polluted, and destined for decline. Such ideas of solar fragility fed seamlessly into Victorian apocalyptic imaginaries, where the ‘end of heat’ echoed biblical genealogies of cosmic fire and final judgment. At the same time, thermodynamics was inseparable from empire. Coal and iron powered the Lancashire mills, These infrastructures not only promise economic growth and progress but also propagate narratives that can marginalise local histories and knowledges. For instance, in the debate over fracking, protest participants frequently adopt a global perspective. The energy economy was thus experienced not only as industrial but also as global and colonial, linking the textile worker in Lancashire to the plantation in the American South and to resource frontiers across the empire.

Within this milieu, Cotton Famine poetry absorbed and refracted thermodynamic logics. Figures of heat, fire, smoke, and stoppage carried ethical weight: they translated abstractions of conservation and dissipation into bodily experience, rendering hunger as waste, providence as fuel, and exhaustion as entropy. Just as the first law promised that nothing was lost, so too did poems insist on endurance and community persistence; just as the second law warned of

irretrievable decline, so too did poems register the grinding down of bodies and the futility of waiting. Thermodynamic ethics became vernacularised in verse that linked industrial engines to moral order, cosmic decline to the daily stoppage of mills, and providential providence to the uncertain regularity of fuel.

The analytic wager of this chapter is that reading for conservation, conversion, dissipation, and waste clarifies why these images and moral arguments recur in the Cotton Famine corpus, and how working-class cultural production rendered abstract scientific logics tangible in everyday life. In the sections that follow, I reconstruct the industrial and media ecology of the Cotton Famine, trace how thermodynamic ethics circulated in mid-Victorian public culture, and turn to close readings of selected poems that exemplify how coal temporality, bodily exhaustion, and providential argument were stitched into the textures of verse.

### Fossil Fuels, Factory Rhythms, and the Poetics of Energy

If thermodynamic principles framed the intellectual atmosphere of the 1860s, fossil fuels grounded that atmosphere in the textures of everyday life. Coal did not simply power Lancashire's engines; it organised social time, material experience, and cultural imagination. Cotton Famine poetry captures this entanglement, translating the stoppages of mills, the hunger of idle bodies, and the monotony of waiting into a poetics of energy. Figures of smoke, furnaces,

and exhaustion do not merely echo scientific discourse but transform it into vernacular registers of endurance, providence, and waste.

Rather than treating workers as passive recipients of elite knowledge, these poems demonstrate how energy logics were inhabited and reworked from below. The pervasive uncertainty of subsistence became a metaphor through which thermodynamic ideas were given popular form. What in scientific circles was described as ‘conservation’ or ‘dissipation’ emerged here as thrift, providence, and squander, moral and affective idioms that bound abstract laws to lived practice.

In this sense, Lancashire’s poetic press functioned as a laboratory of cultural translation. Just as Crosbie Smith and Barri Gold identify Victorian literature and theology as sites where energy metaphors gained traction, Cotton Famine poetry shows how the same dynamics circulated in working-class verse. But unlike canonical novels or sermons, this vernacular poetry foregrounds the material immediacy of unemployment, hunger, and factory silence. The poetics of energy in these texts thus illuminates how fossil fuels were not only technical substrates of production but also cultural substances, shaping affect, ethics, and community identity.

Scholars such as Allen MacDuffie (2018), Tina Choi (2007), and Jennifer Kuskey (2019) have shown how thermodynamic ideas infiltrated Victorian cultural production, shaping literary and visual metaphors of waste, labour, and conservation. Barri J. Gold (2020) further argues that Victorian energetic discourse contained a deeply ecological strand, whereby machinery was imagined in seamless relation with nature, producing what she calls a ‘deep ecological sensibility.’ Similarly, Franchetti (2021) demonstrates how the language of degeneration within thermodynamics resonated with broader concerns about the nation’s spiritual welfare (p.122). These critics largely focus on canonical literature and visual culture. My intervention is to read Cotton Famine poetry, produced by working-class writers in Lancashire’s newspapers, through

this same energetic lens, showing how concepts of conservation and dissipation permeated vernacular verse as much as elite literature.

Other cultural narratives reinforced this energetic imagination. Naomi Yuval-Naeh (2019) shows how coal was reframed as a botanical wonder, linking industrial power to deep-time forests and national pride. She argues:

The historical narrative of coal evoked two lines of thought. The first is the association of coal with its botanical origin. This enabled the mental shift of coal from its industrial-associated everyday existence to a realm of deep-history fantasies of pristine nature ... ultimately providing an alternative fictional narrative for the Industrial Revolution itself (Yuval-Naeh, 2019, p.439).

Thomas Huxley's essay *On the Formation of Coal* (1870) extended this fantasy, offering a botanical genealogy of the steam engine:

A plant grows from a spore, which symbolises James Watt's mind, developing into the steam engine from which 'all the prodigious trees and branches of modern industry' have grown (Huxley, 1870, p.629).

Such depictions elided the dangerous labour of mining, instead romanticising coal as both natural and providential. John Scafe's 1819 poem *Council of Metals*, with its personification of King Coal, demonstrates the imaginative mobility of fossil materials in early nineteenth-century writing. At the same time, as Imhotep-Jones (2020) notes, automata and automatic machines redefined notions of autonomy and dependence:

Automata and automatic machines were part of a bounding and definition of autonomy, freedom, and selfhood that defined a social world in which certain groups of people were always profoundly dependent, and therefore unfree, to

begin with ... Romantic machines were flexible, active, aesthetic, and spontaneous social extensions of their users, weaving humans together with each other and with their environment (Imhotep-Jones, 2020, p.16).

In this cultural field, thermodynamics was not an abstract doctrine but a moralised discourse. Crosbie Smith (1998) demonstrates that Presbyterian ethics framed energy as a divine gift that imposed obligations of labour and thrift, making 'waste' a sin:

The energies of nature formed a vast reservoir which enabled man to seize 'the opportunity of turning them into his own account'. Nature's energies were thus structurally analogous to other divine gifts to mankind ... having received the gift and being unable to reciprocate, [humans] had a duty to make use of that gift in what appeared to be an exchange economy (Smith, 1998, p.120).

Daggett (2018) similarly argues that the science of energy became a vehicle for moralising productivity in the industrial era. As William Thomson wrote, transformations of energy 'remove irrecoverably from the control of man sources of power' that might otherwise have been made useful (Smith, 1998, p.110). Entropy, therefore, was not merely a physical principle but a moral warning.

These ideas shaped how workers in Lancashire encountered their own conditions. The Cotton Famine poems register as analysed above, notions of stoppage, idleness, hunger, and endurance, tropes that echo the thermodynamic pairing of conservation and waste. Anson Rabinbach (1992) shows how the metaphor of the 'human motor' linked thermodynamic science to industrial labour:

Social modernity, the project of superseding class conflict and social disorganisation through the rationalisation of the body, emerged at the

intersection of two broad developments: the thermodynamic ‘model’ of nature as labour power, and the concentration of human labour power and technology of the second industrial revolution (Rabinbach, 1992, p.289).

The poetry I examine here demonstrates how such logics of energy, labour, and providence were absorbed, refracted, and contested in vernacular forms.

At the same time, Cotton Famine poetry opens a space for what Bruno Latour (1987) famously describes through his rugby metaphor of the ‘collective construction of facts.’ Scientific knowledge, he argues, does not arrive fully formed but is carried forward like a ball in play; passed, defended, and stabilised through the work of many actors. Thermodynamics in the 1860s was precisely such a contested ‘ball’; scientists like Thomson and Clausius articulated its principles, but clergy translated them into sermons, journalists popularised them in the press, and communities debated their moral implications. Working-class poets in Lancashire joined this ‘scrum,’ embedding metaphors of conservation, dissipation, and waste in vernacular verse. By doing so, they did not simply reflect the new science but helped stabilise its cultural meaning, ensuring that energy was understood not only as a physical principle but as a moral and social truth. As Jasanoff (2004) reminds us, sociotechnical systems always operate at the nexus of science, technology, culture, and power; Cotton Famine poetry vividly demonstrates how those systems were inhabited and narrated from below. These poems show how working-class writers participated in that construction, embedding energy metaphors in popular verse and thereby contributing to the genealogy of energy knowledge.

The poems thus mark an early cultural response to fossil-fuelled capitalism, offering insight into how labourers understood the entanglement of bodies, factories, and coal. As Malm (2016) argues, coal-driven industrialisation inaugurated the fossil economy, with consequences later elaborated in Moore’s (2015) account of the metabolic rift. The poetry does not theorise these

dynamics abstractly but registers them affectively: in the cadences of stoppage and waiting, in the imagery of furnaces and smoke, and in the moral vocabularies of providence, thrift, and waste. By situating this body of verse within the cultural resonance of thermodynamics, I establish it as a privileged archive for understanding the early poetics of energy, a corpus that reveals how workers made sense of fossil fuel regimes at the very moment they were consolidating.

‘And Coals of Fire take the Forms of Victuals’: Energy, Labour and The Cotton Famine Poetry.

The poetry’s significance lies in how it refracts the global dynamics of fossil capital through the immediacies of daily life. Where Malm (2013; 2016) and Moore (2015) chart the structural logics of coal and capitalist expansion, the verse captures their local imprint; mills silenced, households destabilised, and solidarities articulated in religious and political idioms. These poems do not abstract but embody: they show how world-systems analysis translates into the textures of unemployment, communal resilience, and moral argument. In this sense, the Cotton Famine corpus not only aligns with critiques of fossil capitalism but also grounds them in vernacular cultural practice.

Working-class poetry of this century provides an account of the cultural shifts that took place during this era of massive social change and reflects the use of printed literature as a socialising medium that bound workers together in a collective experience within industrial society.

As Vicinus argued half a century ago, ‘Literary works are valuable evidence to why and how the English worker, thought to be close to revolution through the 1840s, came to accept industrial life as inevitable’ (1971, p. 549). Labouring subjectivities in Lancashire, which deeply felt the economic circumstances of intensive industrial production under Victorian globalisation, offered poetic expression as a form of social discourse on the material and cultural

conditions of their lives. These poems act as mediators of one of the first global economic crises, registering how the dislocation of transatlantic cotton supply chains was acutely experienced at the local scale. The abundance of coal that fuelled the steam engines of the cotton mills had already created conditions of overproduction when, during the American Civil War, the Union blockade cut off exports of raw cotton. This accelerated the Lancashire Cotton Famine, throwing nearly half a million workers out of employment. Cotton Famine poetry documents this conjuncture of fossil-fuelled capitalism, where globalised flows of cotton and coal converged in Lancashire's factories. Malm and Hornborg frame this nexus starkly:

The rationale for investing in steam technology at this time was geared to the opportunities provided by the constellation of a largely depopulated New World, Afro-American slavery, the exploitation of British labour in factories and mines, and the global demand for inexpensive cotton cloth. Steam engines were not adopted by some natural-born deputies of human species: by the nature of the social order of things, they could only be installed by the owners of the means of production (2014, p. 63).

Poets in Lancashire's newspapers did not write abstractly about these conditions. They addressed slavery and abolition explicitly, often expressing solidarity with enslaved African Americans even while enduring their own hunger and unemployment. The paradox of supporting emancipation while facing local deprivation underscores the entanglement of religious ethics, thermodynamic metaphors of labour and waste, and a global politics of exploitation. Abolitionist discourse, though frequently couched in Christian providentialism, reveals how working-class cultural production could align with transatlantic struggles, articulating a moral economy that challenged both mill owners and imperial profiteers.

Andreas Malm's account of fossil capital clarifies the structural stakes behind these experiences. In *The Origins of Fossil Capital: From Water to Steam in the British Cotton Industry* (2013), he traces how the decisive shift from water to coal in Lancashire's mills inaugurated the fossil fuel economy. Steam power liberated capital from the geographical fixity of rivers and the temporal rhythms of daylight or season. As Malm argues, 'Water power was a barrier that had to be knocked down for the fossil economy to emerge' (2013, p. 19). Unlike water, which tied production to localities and their environmental fluctuations, steam could be installed wherever profit dictated. 'Steam was appreciated for having no ways or places of its own ... it was absolutely, indeed ontologically subservient to those who owned it' (Malm, 2013, p. 45). Human labour, by the same logic, was made equally subservient to the new energy material and its prime movers. Workers became geographically and temporally extricated from the local communities that had once been tied to water sources; their rhythms were redefined by the abstract temporality of steam.

Malm extends this argument by emphasising how fossil fuels themselves were called into existence as capital's energy deposits. 'Needless to say, Capital is unable to literally manufacture coal seams or any other fossil fuel reserves, but it can call them into being as energy deposits by mobilising its own resources: labour power and means of production' (Malm, 2013, p. 57). Fossil fuels, then, were never simply natural forces 'dispensing energy by existing'; they were conjured into social reality through capitalist mobilisation. This reorganisation of energy, labour, and geography resonates with Henri Lefebvre's (1991) distinction between 'absolute space,' the locally embedded spaces of natural geography—and 'abstract space,' the de-localised, commodified spaces of industrial capitalism. In the cotton towns of the Northwest, the transition from water to coal thus enacted a profound shift from situated, place-bound forms of production to abstracted regimes of fossil capital, a shift registered not only in economics but also in culture and affect.

Marxist critique and affect theory together provide the conceptual tools to approach Cotton Famine poetry as more than historical artefact. The poems can be read as what Lawrence Buell (2005) describes as ‘world-unmaking storytelling’: narratives that challenge or dismantle dominant worldviews by exposing their contradictions. Without consciously theorising collapse, the poems nevertheless destabilise the romanticised vision of industrial progress by foregrounding its human and ecological costs. They register stoppage, hunger, and endurance as counterpoints to the triumphalist rhetoric of fossil-fuelled growth. In this sense, they anticipate what Lauren Berlant (2011, p. 16) calls the evidentiary force of affect, where ‘affective experience provides evidence of historical processes.’ The repetitive tropes of want, fatigue, and providential appeal in these poems are not incidental; they crystallise the lived consequences of a system straining under its own energetic and political contradictions.

This framing also allows us to situate Cotton Famine poetry within a longer genealogy of fossil-fuel attachment. Stephanie LeMenager’s concept of *petromelancholia* describes how oil in twentieth-century North America became an embodied memory and habitus, woven into everyday practices to the point of grief at its imagined loss (2014, p. 104). Though focused on a later energy regime, her insight resonates with the nineteenth-century condition of coal dependence. In Lancashire, the mill, the factory, the chimney, and the furnace became more than industrial artefacts; they structured identity, memory, and social fabric. The poetry reveals this attachment by entwining material deprivation with symbolic landscapes of coal and smoke. As with LeMenager’s Americans, detaching these workers from the infrastructures that sustained them was not simply economic but existential. The Cotton Famine poetry, then, can be read as an early register of fossil-fuel melancholia: grief and endurance entwined with the very systems that caused suffering.

Predominantly, literary scholarship has focused on the dialectal idiosyncrasies of Lancashire poetry—as memory work, historical artefact, or linguistic survival (Hollingworth, 1977). Projects such as *Resurfacing Lancashire Cotton Famine Poetry: An Archival Project* (Rennie, 2017) have further documented and digitised these texts, highlighting their cultural and historical value. Yet my approach foregrounds not only their linguistic or historical significance but also their energetic and affective dimensions. These poems written en masse by cotton weavers during the years of ‘Distress’ or ‘Cotton Panic’ reveal how workers’ lived experiences were encoded in verse. They serve both as testimony to geopolitical upheaval, which was foregrounded by the American Civil War, the blockage of cotton supply, leading to the oscillations of global capitalism, and as its cultural evidence of how coal itself became inscribed in bodies, temporalities, and landscapes.

This double register is captured with particular clarity in *The Smokeless Chimney*, written by E. J. Bellasis (The Lancaster Lady) and published in the *Blackburn Times* in 1862 (Poetry of the Lancashire Cotton Famine (1861–5), n.d.). Addressing a stranger travelling on the Northern Railway, the poem urges its reader to read the unclouded air over Lancaster as a sign not of health but of deprivation, an atmosphere cleared by halted production. Here, energy and deprivation, atmosphere and labour, infrastructure and identity, are bound together in a single image. Such poems crystallise the cultural metabolism of coal at the very moment fossil capital was consolidating, offering us a vital archive of the affects and attachments that still shape our present.

Stranger! Who to buy art willing,

Seek not here for talent rare;

Mine's no song of love, or beauty, But

a tale of want and care.

Traveller on the Northern Railway!

Look and learn, as on your speed;

See the hundred smokeless chimneys, Learn

their tale of cheerless need.

Ah! Perchance the landscape fairer

Charms your taste, your artist-eye;

Little do you guess how dearly Costs

that now unclouded sky.

How much prettier is this country?

Says the careless passer-by;

“Clouds of smoke we see no loner,

“What's the reason? – tell me why.

(...)

“Ah! To them each smokeless chimney

Is a signal of despair;

They see hunger, sickness, ruin,

Written in that pure, bright air.”

Stranger, if those sorrows touch you,

Widely bid your bounty flow;

And assist my poor endeavors To

relieve this load of woe.

Let no more smokeless chimneys

Draw from you one word of praise;

Think, oh, think upon the thousands Who

are moaning out their days.

(...)

Rather pray that peace, soon bringing

Work and plenty in her train,

We may see these smokeless chimneys

Blackening all the land again.

The lyrical 'I' makes a passionate plea to train travellers to look around them in an investigative way, to pay close attention to the surrounding environment that they pass by and really ask themselves what story do the 'smokeless chimneys' tell. It's as if the lyrical voice is holding open a space for the traveller to occupy with their senses to become part of the crisis within which the people of Lancashire find themselves suspended in spatially and temporally. Engaging with the pristine environment, the poet is a mediator of political dissonance, calling for deeper, critical thought of the ramifications of the smokeless chimneys. The antithesis that

‘pure, bright air’ causes, as it creates ‘hunger, sickness and ruin’, makes for a powerful metaphor and a shocking image by contemporary standards at least. There is a strong sense of irony, reading the poem from a contemporary view of ecological concerns about climate change, air pollution and a warming planet. In the context of the cotton industry, *The Smokeless Chimney* as the *Silent Mills of Lancashire* below, gesture towards the ways thermodynamics played a catalytic role to notions of work and waste (in this case wasted time). The use of the second-person singular pronoun denotes a sense of urgency, as it addresses the reader directly, and also seems that the poetic voice is free by temporal constraints, as if ‘abstract’ time has ‘swallowed’ up and frozen any kind of activity.

The speaker longs to return to what coal promised. A good life, without poverty and suffering, instead they are left with clean air but no food. This resonates greatly with contemporary energy discourses, specifically about who is included or excluded from energy solutions, who has access to renewable energy sources and on whose land energy infrastructures are built. In another poem entitled *The Silent Mills of Lancashire*, by Rev. J. Baker, written in 1862, which appeared in the Bury Guardian, the speaker offers affective commentary of the quietness that is diffused among the previously constant humming of the milling machines.

*The Silent Mills Of Lancashire.*

Ye hives that swarmed with industry, whose hum

World-wide proclaimed a nation’s wealth and power, What

terrible convulsion strikes you dumb?

Why those [portentous] clouds that o’er you lower?

Once were ye resonant with joyous strains

Of labour's voice, from honest hearts that rose;  
  
Now brooding desolation grimly reigns,  
  
Dread silence, eloquent, full-charged with woes.  
  
Your stillness tells of forms gaunt, hunger-worn,  
  
Of blighted hopes, fair visions wrapt in gloom,  
  
Homes miserable, husbands, wives forlorn, And  
  
children wailing, sinking to the tomb.  
  
Yet shall ye tower, when happier days shall spring,  
  
As temple that most godlike virtues shrine, And  
  
to our souls the choicest memories bring  
  
Of patience, meekness, sorrows made Divine:  
  
High monuments of fortitude, which bore  
Deepest affliction; hushed each murm'ring tone  
  
In agony could Heav'n's pure will adore, And  
  
recognise the hand of God alone.

As in the previous poem, this one entwines patriotic iterations of the cotton industry; World-wide proclaimed a nation's wealth and power', with a vision of fossil-fuelled progress as a source of national prestige. The connection between energy and pride is hardly incidental:

Victorian Britain's identity was inseparable from coal, and the symbolic charge of industry extended far beyond local mills into an imperial narrative of technological mastery. The *Silent Mills* juxtaposes stillness and activity in a way that renders machines and workers mutually dependent. The absence of one cancels the other, and the poem registers this suspension as both material fact and spiritual trial. Its appeals to divinity, 'the hand of God,' situate stoppage in a moral framework where future labour is imagined as both economic recovery and providential reward. The oscillation between past prosperity, present desolation, and future restoration maps precisely onto thermodynamic idioms of work, waste, and renewal that were circulating in the 1860s.

What distinguishes this poem is its unusual address. The factory itself becomes the interlocutor, an entity invoked through memory and lament. In turning to a non-human addressee, the poet foregrounds the intimacy of attachment between body and machine. The soundscape is striking: the silence of halted engines is not absence alone but an acoustic marker of hunger and poverty. Time is figured as suspended, resonant with the emergency of the present, yet haunted by the recollection of noise and movement. Such multisensory imagery allows the text to work across registers, pertaining to the aural, corporeal, and the devotional, hitherto binding the conditions of labour to the infrastructures that organised them.

The language of the poem is equally revealing. Written in standard English, it leans on an elevated vocabulary; 'portentous,' 'eloquent,' 'convulsion'—which lends authority and solemnity to its reflections. At once patriotic and elegiac, the diction fuses the idiom of national power with that of intimate loss. The industrial chimney, celebrated as a sign of prosperity and modernity (Mosley, 2001), here becomes both emblem of wealth and index of deprivation. This dual symbolism captures a cultural ambivalence at the core of Victorian industrial life: coal was pride and poison, promise and punishment.

Placed alongside other Cotton Famine poems, *The Silent Mills* demonstrates how verse could crystallise collective experience into images that moved easily between factory floors and national imaginaries. These texts mark a moment when infrastructures of energy and labour were beginning to appear immovable, not only in their physical form but in the imaginations of those who depended on them. Later chapters will show how this condition persists in contemporary Lancashire under nuclear regimes, yet its genealogy lies in the nineteenth century's fusion of labour, coal, and providence. Thermodynamic discourse, religious ethics, and poetic testimony together created an imaginative framework in which work, waste, and ecological anxiety were inseparable.

Scholars in energy humanities argue that infrastructures become environments in themselves: once installed, they reshape memory, attachment, and expectation to the point where alternatives are hard to envisage (LeMenager, 2014; Boyer, 2015). The Cotton Famine poems already register this difficulty. Workers who had known life before the mills still framed their deprivation in terms of longing for the return of factory work. The texts reveal how deeply coal had penetrated cultural consciousness, not simply as a resource but as the very condition of collective existence. The inability to think beyond it was not a failure of imagination but the effect of infrastructures that had already reorganised the possibilities of life. The next poem is by an unknown writer with the name *Coals of Fire*, published in the *Blackburn Standard*, and was written in response to a speech at the meeting of the New York Chamber of Commerce in December 1862. The speech declared that 'In sending food to the starving weavers of Lancashire, we are heaping coals of fire on the head of England', which creates a powerful image of the importance of coal as a fuel not only for the Lancashire and wider Northwest cotton industry, but also as it 'fuelled' people's identities and livelihoods. However, the speaker in the poem counteracts this by focusing on the circumstances that led to the crisis, calling for the opening of mills again and employing workers to operate the furnaces and start production.

The tone is quite ironic, as the poetic voice responds to the conflation of sending food with a revived national machine that would start up again, by ‘challenging’ those making these claims using the synecdoche ‘vast be your furnaces and ‘kettles’ to signal that the only way people can get food is if they can find jobs.

*Coals of Fire*

If heaping burning coals of fire,  
On England’s head be your desire,  
And coals of fire take form of victuals,  
Vast be your furnaces and kettles; Increased  
the number of your stokers,  
And much enlarged the size of pokers.  
Whate’er the motives be which led  
Your generations hearts to send us bread,  
Impulsive alms when freely given,  
Are quite acceptable to heaven;  
Money from unreflective sinners  
Will give our wives and children dinners;  
And charity, what heart can doubt it,  
Excels philosophy without it.

The speaker inhabits a place filled with frustration at the embargo on cotton and writes with striking directness about what should be done. The replacement of high-quality American cotton with inferior Indian Surat cotton made the production process slower and wages lower, since workers were paid on piecework (Rennie, 2020). Because Surat’s shorter fibres were harder to spin, workers produced fewer pieces in the same time, and their already precarious earnings

shrank further. This sharpens the poetry's material focus: the language is that of the factory, of the substance that powered it. The line 'coals of fire take form of victuals' conflates nourishment with fuel; coal becomes both deadly and indispensable, the epitome of Berlant's 'cruel optimism.' The poetry of the Cotton Famine becomes an affective medium through which communal experiences of fossil fuel dependence are registered at the level of the body. As Jane Bennett (2010) argues in *Vibrant Matter*, matter itself exerts a kind of vitality, shaping human dispositions and social formations. In this sense, the Lancashire poets' preoccupation with coal does not reduce to metaphor: it testifies to coal's agency in reorganising life, work, and imagination. The blackened fragments that fuelled the engines appear in the verse as both sustenance and poison, registering the intimate, visceral entanglement of human survival with fossil energy.

What these poems strip away is telling. There is no reference to finished cloth or textile outputs, no celebration of product; only the condensed matter of coal, blackened smoke, furnaces, and engines. Workers' poetics were deeply attuned to the materiality of coal, registering both its destructive and sustaining force. As Rennie notes, 'Much of this poetry displays an acute awareness of its place in the world ... it also provides a greater understanding of a moment in history where poetry mediates the relationship between the Victorian global and local in particularly significant ways' (2020, p.126). His observation clarifies how Lancashire's labouring class, forced into confrontation with the instability of Victorian globalisation, began to imagine themselves as global subjects for the first time.

The poems record this realisation in affective terms. Workers understood themselves to exist in a configuration of energy sources, machines, and bodies, an early recognition of what we would now call energy cultures. Religious motifs reinforced this entanglement. Lines such as 'If heaping burning coals of fire, On England's head be your desire' recall Proverbs 25:22, where

‘heaping coals’ can mean kindness toward enemies but also judgement and purification. In the Cotton Famine poems, the biblical image becomes a plea to the wealthy for aid, while also binding energy, morality, and survival together in a single metaphor. This dual register (material and spiritual) captures the thermodynamic ethics underpinning Victorian proto-energy culture.

This interplay of labour, energy, and providence recurs across the corpus. In *The Lancashire Hills* (Burnley, 1 August 1863), the poet contrasts the natural beauty of the hills with the haunting silence of deserted mills. Where chimneys once belched smoke, absence and stillness mark the landscape, staging a powerful reflection on energy, industry, and community.

### *The Lancashire Hills*

The Lancashire hills stand towering high  
Their summits are tinged with gold;  
The valleys are clothed with rich living green,  
Their beauties can never be told.

As we speed on the rail, -imposing sight!  
We may look at the clear sparkling rills,  
Then turn our eyes upward, there to behold  
The beautiful Lancashire hills.

The scenery is grand, beyond all compare,  
But ‘tis sad to behold those nu’rous mills All  
standing in silence, deserted, and lone,

At the foot of these beautiful hills.  
Ah! When will the better times come, my poor boys?  
When again may you go to the mills? So merry  
and gay, you will then wend your way,  
To your work near the beautiful hills.  
In gratitude then your voices you'll raise,  
Whilst working you are at the mills,  
With joy and delight you'll smile at the sight, Of  
the beautiful Lancashire hills.  
May this good time draw near, and banish all fear,  
When you'll haste with delight to the mills;  
Then, oh, with what joy the Lancashire boy Will  
climb up these beautiful hills.  
The hearts of their parents will likewise be glad-  
They also will haste to the mills;  
They'll view with delight the glorious sight Of  
the beautiful Lancashire hills.

Several themes emerge from this poem, each of which carries broader implications for how we understand energy cultures. One is the fate of large infrastructures once their productive capacity collapses. In their state of decay and ruination, mills and factories appear more material than ever: their stone, iron, and brick surfaces stand starkly exposed once the veil of commodity production has been stripped away. What once signified prosperity and progress now speaks instead of waste, dereliction, and fragility. Ruin renders the industrial landscape more legible, turning machines into monuments of exhaustion rather than engines of accumulation.

Another theme is the way Victorians connected thermodynamic principles with moral categories of work and waste. The language of energy conversion, conservation, and dissipation became a vernacular through which labour itself was measured. In this frame, stoppage was not simply unemployment but a form of entropy: the squandering of human potential, the dissipation of bodily force. At the same time, endurance and thrift could be valorised as forms of conservation, aligning the physical principles of energy with Protestant ethics of providence and restraint.

Taken together, these themes trace an early genealogy of how communities become attached to energy materialities and to systems of sociotechnical change. The poems suggest that such attachments are not only utilitarian but affective and ethical, structured by the metaphors and moral logics available in a given historical moment. This is why the Cotton Famine corpus matters beyond its immediate context: it shows how coal and steam were not simply fuels for production, but categories through which people made sense of crisis, survival, and obligation. Reading these verses alongside later cultural articulations of nuclear power or renewable energy reveals the persistence of this dynamic—where infrastructures are narrated not only as technical systems but as moral economies that bind together bodies, environments, and machines. The themes of ruination and thermodynamic ethics identified in the poem can be sharpened further by considering how infrastructures are reconfigured once they fall into disuse. As the verses suggest, decay makes factories and mills appear more material than when they were in motion, exposing the raw physicality of stone, iron, and coal once detached from their role in production. Tim Edensor (2005), in *Waste Matter – The Debris of Industrial Ruins and the Disordering of the Material World*, describes this process as one of de-commodification. When industrial landscapes are abandoned, they cease to operate as stable sites of production and become co-produced by non-human bodies, forces, and elements.

As he puts it:

Things give up their solidarity and form, yielding to the processes which reveal them as aggregations of matter, erasing their objective boundaries. This physical deconstruction of objects reveals the artifice through which they are structured to withstand ambiguity. This erosion of singularity through which the object becomes ‘un-manufactured’ remembers the process by which it was assembled: the materials that were brought together for its fabrication, the skilled labour that routinely utilised an aptitude to make similar things, the machines and tools which were used to shape it (Edensor, 2005, p. 320).

Read alongside the Cotton Famine poetry, Edensor’s framework clarifies how ruination itself becomes an archive: infrastructures are remembered both in their material decomposition and in the poetic imagination of those who lived alongside them. The poems register this double movement, where energy systems simultaneously sustain life and collapse into debris, making visible the precarious attachments that emerge around fossil fuels at moments of crisis. Crucially, they also expose the role of non-human agencies (coal dust settling on bodies, smoke lingering in the atmosphere, abandoned chimneys marking the skyline) as active participants in shaping experience. These elemental presences destabilise the boundary between human and machine, labour and fuel, text and material. In the poetry, as in Edensor’s analysis, ruination is not simply absence but a generative process through which infrastructures become entangled with weather, decay, and atmosphere.

The mills in the poem are reimagined not only in relation to the industrial processes they once facilitated but also as part of their natural surroundings, the Lancashire hills. Unlike many Victorian writers, such as Dickens and Gaskell who often framed industrial spaces in opposition to the natural world, this poem presents a more integrated view. The mills, when operational, are portrayed as a gateway to the natural world, tying human industry to the beauty and vitality

of the surrounding environment. The writer imbues the mills with human sensibilities, describing them as ‘deserted’ and ‘alone,’ suggesting that removed from their industrial purpose, they are also excluded from the social fabric of work and production. This dual positioning, simultaneously part of and apart from nature, challenges typical Victorian binaries and invites readers to consider the mills not as mere intrusions upon the landscape but as integral to the harmony of human and natural coexistence. As the mills fall into silence, their connection to the natural world is emphasised, highlighting both their former vibrancy and the loss their inactivity represents. Accordingly, ‘these products can take on mysterious form, have no recognisable purpose except for the ruin’s former habitué’ (Edensor, 2005, p. 323). The poem recontextualises the infrastructures of production by shifting focus from their industrial use to their geographical setting, emphasising their coal-fuelled intensity within the natural landscape.

These mills are inscribed with traces of their previous capacity, and their material qualities serve as poignant reminders to the writer, an ex-weaver, of what has been lost since production came to a halt. This acute awareness of where the mills stand, within the beautiful scenery, appealing to the aesthetics of the locality to catch the attention of their readers’ romantic sensibilities. This kind of appeal is prominent in other poems as well, contrasting the abundance of nature to the complete lack of industry. Furthermore, there is a pairing of seemingly contrasting ideas present here, however with closer inspection these notions become rather complimentary to each other. As we have seen in earlier poems, the contrasts of idleness and activity, silence and noise, nature and industry are not merely rhetorical devices but structuring binaries that carry forward into both literature and public discourse on energy. For the Victorian cotton mill workers who composed and circulated these verses, such pairings provided a cognitive and cultural anchor: a means of making sense of the sudden complexities of industrial life and the upheavals of global capitalism. Yet these binaries did more than organise perception; they were also conditioned by the epistemic scaffolding of nineteenth-century energy science. Developed at

the intersection of religious ethics and moral philosophy, thermodynamics entered the cultural field not as neutral knowledge but as a set of frameworks through which energy materials could be imagined, narrated, and judged. In Lacanian terms, they became part of the ‘imaginary’—a register of images, binaries, and identifications through which subjects negotiate their relation to material and social reality.

These interpretive habits did not disappear with the mills. As the later chapters demonstrate, similar pairings surface in contemporary theatre and artistic projects, where they shape how audiences confront nuclear legacies, renewable technologies, and ecological collapse. They also reverberate in the testimonies of communities who live in the shadow of large-scale infrastructures, revealing how binaries forged in the nineteenth century continue to structure energy imaginaries today.

The discourse consolidated in mid-Victorian Britain through the laws of thermodynamics framed energy in terms of stark binaries, work and waste, conservation and entropy, machine and human, nature and ‘heat death.’ This schema crystallised into a paradigm that continues to shape how energy, climate change, and ecological conservation are imagined. Yet such a paradigm works through erasure: it privileges order and productivity while relegating multiplicity, ecological interdependence, and alternative epistemologies to the margins. In Cotton Famine poetry, we see this framework refracted into lived experience, where energy is not a neutral abstraction but a source of hardship and despair. This becomes especially clear in J. Harvey Perry’s *Drooping Hearts in Lancashire*, published in the *Ashton and Stalybridge Reporter* in 1863. Here, desperation is palpable: the poem juxtaposes images of poverty and hunger with the absence of fuel and food, collapsing multiple forms of energy into a single register of lack. Unlike poems that foreground Lancashire’s geography or landscapes, Perry’s

verses centre on the workers themselves, their families, and the deserted mills whose silence underscores the pervasiveness of unemployment.

*Drooping Hearts in Lancashire*

In the north is bitter wailing,

Signs more plaintive day by day,

Fuel, food and raiment failing;

Hear, O hear their mournful lay; Sorrow's

cloud-wreath dark and drear,

Sadly looms o'er Lancashire.

(...) Now the days are dark and dreary, Still

desponding more and more;

Languid, listless, faint, and weary,

Scarce they venture out of door;

Winter's bitter cold is here,

Help the folk of Lancashire.

(...) Let the arrows soon be heeded, Which

so bravely have been borne;

Fuel, food, and clothes are needed,

Fill a brighter day shall dawn;

Let your kindness quickly cheer Drooping

hearts in Lancashire.

When their occupations flourish, None

more freely give than they;

Must they now from famine perish?

Faint, and droop, and die away?

No! the welcome shout we hear,

‘Aid shall come to Lancashire!’

As Jessica Kuskey notes in *Our Mutual Engine: The Economics of Victorian Thermodynamics*, ‘Mid-century popularisations of thermodynamics claimed ‘energy’ as well as ‘work’ and ‘waste’ as specific scientific concepts, which troubled pre-existing cultural notions of work and waste as primarily moral and economic issues’ (2013, p. 7). Cotton Famine poetry demonstrates how this conceptual shift travelled beyond laboratories and pulpits into the textures of vernacular verse. Following Kuskey’s argument, I suggest that the steam engine, as the emblem of early nineteenth-century industrialisation, did not simply reshape labour practices but also provided the imaginative scaffolding through which ideas of work, waste, and conservation were redefined.

This uptake was mediated by print culture and language choice. As Hollingworth (2013) observes, while most readers in Lancashire still spoke in regional dialects, much of the published poetry appeared in standard English, a strategy that lent moral seriousness and widened circulation. Yet dialect poems, such as those that personified the steam engine as ‘Owd Ned,’ reveal another layer of thermodynamic imagination: here the language itself carries the

rhythms of stoppage, hunger, and fatigue, translating abstract scientific notions into the cadences of working-class speech. In this way, Cotton Famine poetry does not simply echo scientific discourse; it shows how ideas of energy were reworked according to the linguistic registers and print networks through which they circulated.

To a factory aw went, aw war ne'er in one afore,

They were twisting thrums, and wheels and straps. I'm sure there wur

Many a score,

They said owd Ned turn'd a long wheel, and long wheel a strap, By

gum thinks I to myself owd Ned's a rare strong chap.

As Brian Hollingsworth argues: 'Owd Ned' raises hopes that its subject matter will be the mighty new factories and mills that were transforming the cotton industry (...) (Hollingsworth, 2013, p. 290). The ballad is entitled 'The Fine Old English Gentleman' and appears in the broadsheets as one of the few poems written in dialect that depict the new industrial age. By the 1860s, when the closing of the mills meant thousands of workers were left unemployed, they turned to singing songs about their hardships on the street for money, which drew the attention of a middle-class audience who wanted to offer help to the sufferers, hence a new readership for dialect poetry to be published was born. Furthermore, with more working-class adults receiving elementary education, broadsheet poetry written in regional dialect was a way to strengthen community ties and offer a sense of belonging, of a common lived experience, which I argue, is prevalent also in multiple temporalities of fossil-fuelled economies and intense production. In *Th' Shurat Weaver's Song* by Samuel Laycock, the poetic voice is a mill worker

who has to manipulate the inferior quality Surat cotton, as I mentioned above, and recounts the difficulties of this raw material in dialect poetry.

*Th' Shurat Weaver's Song*

Confound it! aw ne'er wur so woven afore

Mi back's welly broken, mi fingers are sore;

Aw've bin starin' an'rootin' among this Shurat, Till

awm very near getten as bloint as a bat.

Every toime aw go in wi'mi cuts to owd Joe [I think this is another nickname for the steam engine, or the foreman of the mill]

He gi'es me cursin', an'bates mi an'o;

Aw've a warp I'one loom wi'both selvedges marr'd,

An' tother's a bad, for he's dressed it to'hard.

Poems like these, written in vernacular rather than standard English serve a twofold purpose: they offer a vehicle for the readership who were weavers to identify with, give voice to their disenfranchisement, and recognise themselves in the protagonist, as Laycock (1826-93) himself was a mill worker since he was nine years old. As for the middle-class readers, the influence of dialect verse was affective, albeit in a different form, evoking romantic sensibilities of Victorians concerned with the loss of innocence, and the juxtaposition of 'the 'rural' dialect of the observers against the 'industrial' subject matter that is an object of their wonder' (Hollingworth, 2013, p. 295). It could be argued that the poems of the Cotton Famine written in standard English acquired a more sombre, 'moral' tone to appeal to charitable forces in order

to inject the area with much needed material help. The poems written in dialect, on the other hand, negotiated notions of authenticity in a rapidly changing industrial environment but also encompassed Victorian ideals about the valour of a long-gone rural past. As Taryn Hakala argues in ‘A Great Man in Clogs: Performing Authenticity in Victorian Lancashire’: ‘Just as Standard English became a symbol of virtuous morality for many speakers in the nineteenth century England, especially for the middle classes of the metropolis, the Lancashire dialect became a symbol of virtuous morality for middle-and working-class Lancastrians alike’ (Hakala, 2010, p. 391).

Hakala’s argument echoes Kuskey’s reading of the morality trajectory of work and waste in the Victorian era, and in the case of the dialect poems versus the standard ones in the poetry of the Cotton Famine, we can see the foundations of worker identity within fossil-fuel capitalism, namely the ways productivity is always constructed upon moral terms. Moreover, the vernacular verse of this era served the purpose of constructing, linguistically, binaries about where ‘nature’ is located (‘rural’ versus ‘industrial’) for the middle classes, although the poems still manage to document a considerable shift in the means of production and instances of major sociotechnical change.

*The Cotton Mill by an Operative*

Hum, whirl, click, click, clatter,  
Rolling, rumbling, moving matter,

Whizzing, hissing, hitting, missing, Pushing,

pulling, turning, twisting.

Buzz, bang, going, coming,

Standing, creeping, walking, running,

Piercing, breaking, starting, stopping,

Picking, mixing, fixing, copping

Push, rush, cleaning, oiling,

Slipping, sweating, screaming, toiling;

Fetching, taking, spoiling, making,

Saucing, swearing, bagging, bating.

Here, there, this way, that way, Bad-end, nar-here, fur-on, up there;

Break-it-out, wind-it-off, hurry piece-up,

Get-em-up, quick, or a'st ha' to stop.

Steam, dust, flying choking.

Stripping, grinding, brushing, joking;  
Full time, short time, no time – so that

Enough's in a mill without Surat!

In this remarkable poem, authored by an anonymous writer, we are invited to almost physically experience the inner workings of industry. The caesura highlights the sudden cessation of the mill's activity. Through the use of onomatopoeia, the poet crafts vivid imagery that not only

emphasises the irony of an abandoned mill but also offers an insider's perspective on its operations. The rhythmic use of regular trochaic tetrameter further enhances this effect, evoking the mechanical sounds of the looms and shuttles, and lending a palpable sense of the mill's once-thriving activity. These poetic techniques highlight the richness and variety within this body of work. While common themes run through these poems, the writers employ diverse poetic devices, each distinct in its approach to expressing emotionality and commentary on the crisis. This diversity, I argue, underscores the multiplicity of perspectives within these texts and the potential they hold for rethinking energy cultures. Attending to these lesser-known, peripheral narratives as valuable research objects allows us to glean critical insights, not only into the historical context of energy transitions but also into how we might envision their future.

In another poem, entitled *The Work Shall fill the Mills Again* by John Plummer, the poet incorporates a hopeful plea that the work in the mills should resume, addressing however the desperate conditions that the body of workers are facing, recounting their anxiety and emotional distress.

Though all is dark and dreary now,

And thousands dread the morrow;

While labour's pale and care-worn brow  
Is clouded o'er with sorrow;

Though in the cellars dark and lone

Our famished ones are pining,

And, with a sad despairing groan,

Each dream of joy resigning: - Yet

work shall fill the mills again,

And fact'ry bells be ringing – From

every street, and court, and lane, The

anxious toilers bringing.

(...)

Each soul that wears the thorny crown

Of earthly pain and trial,

She kneel no more in anguish down

'Neath Famine's grim denial; -

But, purified, shall proudly rise

Above each old endeavour,

And learn the Right to love and prize, And

from the Wrong to sever:

When work shall fill the mills again, And fact'ry bells ringing.

From every street, and court, and lane,

The anxious workers bringing. (*Preston Guardian*, Nov 15, 1862)

The religious imagery in *The Work Shall Fill the Mills Again* is central to its emotional and rhetorical power, framing the workers' suffering and hopes for renewal within a moral and

spiritual framework. The reference to the 'thorny crown of earthly pain and trial' explicitly draws on Christian symbolism, likening the workers' plight to the suffering of Christ. This parallel elevates the hardships of famine, poverty, and unemployment to a sacred level, presenting them as trials to be endured with faith and fortitude. By positioning the workers as bearing a Christ-like burden, the poet imbues their suffering with a sense of moral purpose and spiritual redemption, suggesting that their endurance will lead to eventual renewal and purification.

The poem's hopeful vision of the mills once again ringing with activity ties this spiritual endurance to a material revival. The imagery of 'fact'ry bells ringing' and 'anxious workers bringing' conveys not only a longing for economic stability but also a symbolic resurrection of community life and shared purpose. This coupling of industrial revival with spiritual renewal reflects the deeply intertwined relationship between Victorian religious values and the ethics of labour. The poet suggests that through this collective suffering, the workers will rise 'purified' and 'learn the Right to love and prize,' emphasising moral growth and a divine reordering of priorities. The poem's invocation of a higher moral order also functions as a subtle critique of the social and economic systems that left workers in such dire conditions. While the poet envisions a brighter future, the spiritual undertones suggest that renewal requires not only divine intervention but also a reckoning with 'the Wrong' that must be severed. This dual focus on divine hope and moral accountability highlights the interplay of religious faith and social critique in the poetry of this period, encapsulating the resilience and moral depth that defined workers' responses to the Cotton Famine. The poem *Wasted Time* intricately conflates waste, time, and morality, presenting a reflective and morally charged meditation on the passage of time and its ethical implications. In the Victorian era, time was increasingly understood as a finite resource, a shift closely tied to the rise of industrial capitalism. As E.P. Thompson argues in *Time, Work-Discipline, and Industrial Capitalism* (1967), the transition from agrarian to

industrial society brought with it a new disciplinary approach to time, framing it as a commodity to be maximised. This moralisation of time aligns with the speaker's anxiety over its loss, with the 'shadow of Wasted Time' representing not just personal regret but also a broader cultural fear of inefficiency and idleness.

*Wasted time*

Alone in the dark and silent night,  
  
With a heavy thought of a vanished year,  
  
When evil deeds come back to sight,  
  
And good deeds rise with a welcome cheer;  
  
Alone with the spectress of the past,  
  
That come with the old year's dying chime,  
  
There glooms one shadow dark and vat, The  
  
shadow of Wasted Time.

(...)

Who shall recall the vanished years?  
  
Who shall hold back this ebbing tide  
  
That leaves us remorse, and shame, and tears, And  
  
washes away all things beside?

To leave forever this holiday rhyme, To  
shake off this slith from heart and brow,  
And battle this wasted Time?

The Victorian Protestant ethic, as analysed by Max Weber in *The Protestant Ethic and the Spirit of Capitalism* (2001), further heightened the moral stakes of time management. Under this framework, the productive use of time became not only a marker of economic success but also a reflection of one's spiritual standing. The speaker's remorse for 'remorse, and shame, and tears' mirrors this ethic, where wasted time is framed as a moral failure, and the urgency to 'battle this wasted Time' becomes a call for redemption through renewed productivity and purpose.

This moralisation of time is deeply connected to Victorian anxieties about waste, a theme explored by Andreas Malm in *Fossil Capital* (2016). Malm links the industrial focus on efficiency to the commodification of energy and labour, framing waste as an economic and ethical problem. In Victorian Britain, waste was frequently understood as both a moral and societal problem, a perspective reflected in the era's discussions of time as a precious resource. Lee Jackson, in *Dirty Old London: The Victorian Fight Against Filth* (2014), underscores how concerns about physical refuse intertwined with broader anxieties about stewardship and responsibility. Such views parallel the notion that time, like material resources, demands careful management to avoid squandering.

Recent scholarship has extended these ideas into broader cultural and ecological contexts. Jason W. Moore's *Capitalism in the Web of Life* (2015) explores how industrial capitalism entwined human and ecological systems, with time and energy becoming critical sites of extraction and exploitation. The ebbing tide in *Wasted Time* can be read as a metaphor

for these processes, symbolising the relentless flow of industrial progress and the irreversible loss it entails. Similarly, Kate Soper in *Post-Growth Living* (2020) critiques the moral imperatives of productivity in contemporary culture, drawing parallels to Victorian concerns about efficiency and waste.

The poem's moralisation of time also aligns with broader literary narratives of judgment and redemption. Peter Brooks, in *Reading for the Plot* (1992), discusses how narratives often mirror cultural anxieties about control and purpose, framing time as both a narrative and existential resource. In *Wasted Time*, the reflection on past deeds and the call to 'shake off this slith from heart and brow' can be read as a narrative arc of repentance, aligning personal redemption with the broader societal ethos of productivity and renewal.

By weaving together these threads, the poem captures the cultural and ethical weight of time in Victorian society, where it is both a personal and collective resource, tied to spiritual salvation and industrial progress. This dual framing of time as both moral and material underscores the enduring impact of Victorian energy cultures on contemporary understandings of work, waste, and ecological sustainability. The conflation of waste, time, and morality thus serves as a powerful critique of industrial modernity, offering insights into the historical roots of our ongoing struggles with productivity, resource management, and environmental responsibility.

These poems share some characteristics that are directly or indirectly related to the laws of thermodynamics. The first poem uses onomatopoeia and a regular trochaic tetrameter to articulate the sounds, smells, and material components of heavy industry, conflating the human and non-human actors, the machines, and the human operators, gesturing towards the seamless nature of the inner workings of the mills. The laws of thermodynamics can be evoked here, as there is a very palpable sense of urgency in this extraordinary poem, both in its rhythmic manipulation with all the gerunds denoting a wide range of ongoing, ceaseless activity, from

machinic to human and back again. It also portrays the mill's operation as a well-oiled mega machine, of which both the animate and the inanimate towards the t goal: To produce and keep it working. As Sarah Alexander argues in 'The Residuum, Victorian Naturalism, and the Entropic Narrative',

The popularisation of thermodynamics and its conception of time as either productive or dissipative thus supported conceptions of time that had already begun to change based on the demands of industrialisation. (...) The clock has taught the worker to employ himself in profitable labour. It is at once a symbol of the forward movement of time and the possibility of either productive time spent labouring or time wasted (2013, p.106).

As several critics have examined, thermodynamics as a thematic emergence in literary explorations of the nineteenth century was a central influence of the North of England as its political economy relied heavily on its industrialisation (Choi, 2017). In 'Forms of Closure: The First Law of Thermodynamics and Victorian Narrative', Tina Young Choi (2017) examines how thermodynamics offered a patina to Victorian literature and science where ideas about eternal containment, the promise that energy is never lost in the universe, flourished. This thus enabled the co-production of sociotechnical imaginaries that, I argue in turn, still exist in contemporaneous narratives about energy. Literature therefore plays an active role in the construction of science. I argue our attachments to fossil fuels are the legacy of this entanglement, one that has been dictated by capitalism and has serious class undertones, as they are redolent with 'cruel optimism' for certain people, but for the wealthier the possibilities seem to be endless, like the first law of thermodynamics. Throughout this thesis, I analyse narratives that either perpetuate or challenge the idealism of 19th-century thermodynamics, particularly the belief that conservation systems are eternal and imbued with intrinsic meaning. Does this

idealism shape contemporary attitudes toward energy, and if so, does it constrain transitions to alternative energy sources? By dismantling this human-centric framework and placing meaning instead upon the world as a non-human entity, might we unlock new tools for envisioning energy futures? Furthermore, how are sociotechnical imaginaries, cultural visions of how society and technology interact, rooted in the laws of thermodynamics, and how do these imaginaries compare to narratives emerging from sectors such as the nuclear industry, geological facilities, or waste management?

Bruno Latour's (2004) concept of 'modes of existence' provides a useful framework for understanding how thermodynamic principles, originating in the domain of science, extend into other realms such as morality, politics, and culture. These principles have not remained confined to their scientific origins but have been absorbed into broader sociotechnical imaginaries, shaping energy systems and their associated narratives. For instance, the cultural ideal of conservation, deeply tied to thermodynamic thinking, functions as a moral imperative as much as a technical framework. This moralisation creates a rigidity in energy discourse, where transitions to alternative sources are viewed not only as technological challenges, but as disruptions to an established order.

Michel Serres' notion of the 'parasite' (2007) adds further depth to this analysis. Serres suggests that every system (whether biological, social, or technical) is shaped by parasitic relationships, where what is deemed waste or interference can also act as a generative force. Applying this lens to energy narratives, we might question the binary distinction between productive energy use and wasted energy. Waste, in this sense, is not simply a byproduct to be minimised but a dynamic element that can reconfigure relationships within energy systems. This perspective challenges the linear, idealised narrative of thermodynamic efficiency, opening possibilities for thinking about energy transitions as complex, interdependent processes rather than as neat replacements of one source with another.

Latour's (2004) 'Parliament of Things' further complements this by advocating for the inclusion of non-human entities as active participants in energy discourse. Energy systems, whether coal, nuclear, or renewable, are not solely human constructs but entanglements of human and non-human actors. This perspective calls for a rethinking of energy imaginaries to account for the agency of materials, technologies, and ecological systems, challenging the anthropocentric narratives that have historically dominated energy transitions.

Thermodynamics thus serves as a powerful metaphor for energy imaginaries. The First Law, centred on conservation and the transformation of energy, underpins a circulatory narrative that aligns with dominant political economies. This framework emphasises preservation and production, evident in energy systems like nuclear power and its waste management, coal mining, and geological storage facilities. These systems exemplify a worldview that prioritises the maintenance and circulation of energy within a controlled, orderly paradigm.

In contrast, entropy (associated with the Second Law of Thermodynamics) introduces a narrative of decay, dissipation, and disorder. Entropic imaginaries challenge the ideal of perpetual conservation, instead foregrounding the inevitability of degeneration and the transformative potential of decline. These narratives are often articulated in the works of artists and through the perspectives of ordinary people who engage with energy infrastructures not merely as tools of production, but as entities embedded in their lived experiences, environments, and interactions with nature. By emphasising decay and disorder, entropic narratives reimagine energy systems as dynamic and relational, inviting alternative ways of understanding and engaging with energy transitions. As Tina Choi points out:

Avoiding loss is not merely a matter of re-imagining a thermodynamic field, the limits of the system, as physicists claimed, but a function of moral choice. In this cheerful representation, entropy is implicitly the result of human failure, a lack of

resourcefulness, while by contrast conservation is the result of active prevention, a human effort that can recover energy back into useful processes. Steam's initial linear path of 'escape' from a human economy finds itself redirected into that circulatory economy of human needs, from production back to consumption (2007, p. 308).

Choi's observation highlights how the interplay between entropy and conservation is not merely a scientific concern but a moral and cultural one, as I have also foregrounded in my analysis. The framing of entropy as human failure and conservation as an act of resourceful prevention reveals the ideological weight attached to energy discourses, particularly in moments of economic or industrial crisis. This moral dimension of thermodynamics has persisted well beyond the Victorian period, shaping the ways in which energy transitions are imagined and debated today. As the following section will explore, these entropic and conservationist imaginaries were central to the poetic responses of working-class communities during the Lancashire Cotton Famine. The crisis, brought on by disruptions in the global cotton supply, generated a body of poetry that articulated anxieties about industrial stagnation, economic survival, and the moral obligations surrounding work and waste. In these poems, the Victorian preoccupation with thermodynamics becomes more than a scientific principle; it is woven into the fabric of lived experience, where energy loss is felt in the decline of livelihoods, and conservation is framed as an imperative to endure and rebuild. The Cotton Famine Poetry thus provides a compelling lens through which to examine how thermodynamic imaginaries were absorbed into everyday narratives of crisis, resilience, and industrial transformation.

## Entropy, Conservation, And The Melodrama Of The Industrial Crisis: Thermodynamic

### Imaginarities In Cotton Famine Poetry

In a post-empire sociotechnical imaginary, where nationhood, morality, and theology have shifted or fragmented, the emphasis on conservation persists, extending its moral undertones into contemporary energy narratives. Steam's transformation from a linear escape into a circulatory economy of human needs, as described, reflects this persistent alignment of conservation with moral and material progress. Conservation, then, transcends its physical origins to become a guiding principle of sociotechnical imaginaries, shaping how we conceptualise energy systems, human agency, and the possibility of sustainable futures. 'Hence while Victorian thermodynamics might have held the principles of conservation and of entropy in an albeit precarious balance, from many perspectives conservation alone represented the possibility of moral action and improvement' (Choi, 2017, p. 310). A great many of these poems embody this striving for improvement, a return to conservation and an aversion to 'wasted time', resonating the chaotic trajectories of entropy. Mid-nineteenth century thermodynamics was described by one critic thus: 'all that goes on in the civilisation that man has invented [...] can be described most simply in terms of the transfer and transformation of energy'. Critics of Victorian literature have had a renewed interest in examining writers, *vis a vis* thermodynamics, who are contemporaries of the time of the Cotton Famine and the subsequent poetic production addressing it. As Barri J. Gold argues in *ThermoPoetics: Energy in Victorian Literature and Science* (2010), 'Fiction can, however, participate in scientific fact making and can do so quite effectively, while hardly seeming to do so at all. And thermopoetics, broadly speaking, is the widespread word work that went into the making of the facts of energy physics' (p. 153). In her analysis of Charles Dickens' novel, *A Tale of Two Cities*, Gold argues that the narrative, written in 1859, is a 'narrative that wrestles with its relations between force, heat, energy, and work, a

narrative that counts the entropic costs of attempting order and that fears the inevitable loss entailed in the exchange' (p. 152). What is then expressed in these examples of Victorian narratives, is the underlying fear for changes in economic status and anxieties about maintaining the status quo. Similar endeavours are found, according to Jude V. Nixon, in the poetry of Gerard Manley Hopkins, who was a close friend of William Thomson (later Lord Kelvin). In poems such as 'God's Grandeur' Hopkins alludes to the laws of thermodynamics but with the promise that no matter how entropic degradation perseveres, conservation will endure. Nixon points out that '*God's Grandeur* thus celebrates an unalterable quantity of thermal energy' (p.146).

And for all this, nature is never spent;

There lives the dearest freshness deep down things;

And though the last lights off the black West went

Oh, morning, at the brown brink eastward, springs –

Because the Holy Ghost over the bent

World broods with the warm breast and with ah! bright wings. (Mariani, 1970).

Albeit different in focus than the poems of the Cotton Famine, Hopkins's poetry reflects the embeddedness of thermodynamics in Victorian culture and the ways it shaped ideas around work, waste, and time management. To return to the Cotton Famine poetry, the next poem makes a direct plea to the 'Cotton Lords' to provide sustenance to the enslaved people that work in the cotton fields in America, and although the writer's motive for doing so derives from the religious ethics of Christianity and viewing England as the bearer of these ethics, the poem could be read as an indirect critique of colonisation and the close connections between the start of intensive production of raw materials, in this case cotton, and colonisation and imperialism.

*Food or Work*

Cotton Lords! Lords of creation, Feed  
the slaves which made your wealth; Is  
not this a Christian nation?

Food's conducive to their health.

Tho' you shut your factory gates,  
Sell your cotton, stop each loom;  
Tho' war is raging in the States,  
The cotton tree twice yearly bloom.

The time will come when you'll be buying  
Cotton for to work each slave;  
Food or work for they are dying, Save  
them from an early grave.

Save the English maiden's beauty,

Keep them from immoral crime; Those

that has, it is their duty.

For to help at such a time.

The poet's reference to the plight of enslaved people as 'immoral' demonstrates the strong antislavery sentiment that pervaded Lancashire during the American Civil War (1861–1865).

Despite the economic devastation caused by the Union's cotton embargo, many Lancashire workers supported abolitionist efforts, seeing slavery as fundamentally unjust. This solidarity was not merely rhetorical; workers actively organised petitions and public meetings in support of abolition, which were widely reported in the press. For instance, in 1862, a gathering at Manchester's Free Trade Hall passed resolutions condemning slavery and expressing unwavering support for the Union cause, despite the profound economic hardships facing the region. Similarly, workers in towns such as Rochdale and Preston signed petitions that rejected the Confederacy's pro-slavery stance and called for solidarity with enslaved people. These actions were publicly recognised by Abraham Lincoln in his 1863 letter to the working men of Manchester, where he praised their moral clarity and 'sublime Christian heroism' in prioritising the fight against slavery over their immediate material needs.

Reports from newspapers such as *The Manchester Guardian* further emphasised this moral resolve, describing how workers consistently framed their economic struggles as inseparable from the global fight for justice. Elihu Burritt, an American abolitionist visiting Lancashire during the Cotton Famine, noted the workers' commitment to abolition despite their suffering, describing their stance as 'a nobility that transcends all others'. Cultural responses, including poetry like *Food or Work*, mirrored this sentiment, using moral language to connect the workers' plight with the struggles of enslaved people. As Simon Rennie argues in *The Poetry of the Lancashire Cotton Famine* (2020), 'this cultural production reflects the operatives' acute

awareness of their position within a global network of production and oppression, demonstrating a solidarity rooted in shared humanity and structural injustice'. (2020, p. 14). The poem's moral call to action, 'Feed the slaves which made your wealth', aligns with this broader sentiment, tying the workers' local struggles to global justice and underscoring the interconnected nature of human suffering. The following two poems, *Harben's Love Song* and *Threads*, offer distinct yet complementary perspectives on themes of labour, resilience, and social responsibility. *Harben's Love Song* explores emotional and economic dependencies, using personal relationships as a metaphor for broader societal struggles. In contrast, *Threads* weaves together images of textile production and industrial hardship, reflecting on the material and symbolic significance of labour. Together, these works highlight the intersections of economic precarity, emotional endurance, and the cultural imprint of industrial history.

### *Harben's Love Song*

Zostera Marina, grim Manchester's shaking,  
  
One half of her steam-engines silent and still,  
  
No cotton's at hand, and we're in a taking  
  
To know where to turn, for new grist for the mill.  
  
It seems to myself that the notion was clever  
  
(it came a I wandered by ocean apart),  
  
Thy fibre to take, and to make the endeavour  
To give drooping labour another fresh start.

Zostera Marina, though Manchester slumbers,  
And sneers apathetic my labours requite,  
I'm happy to know that inventors in numbers  
Believe that my notion's substantially right.  
So, Zostera Marina, though wise folks are calling,  
My project a thing that can never succeed, He'll never  
climb high who's too frightened of falling;  
The proof of the pudding's in eating, my weed.

*Threads*

I.  
The metal sleeps in its hidden vein,  
The blue-eyed flax waves over the plain, The  
silk-worm spins on the mulberry-leaf;  
Days are spinning their joy and grief.  
Threads are a-twining, manifold,  
Of flax, hemp, cotton, and silk, and gold;  
For joyous Beauty, for Soldier proud,  
For work-dress, cable, halter, and shroud.  
From fields of sense, and mines of thought,  
Threads of life are twisted and wrought;  
We are weaving Character, weaving Fate,

And Human History, little and great.

II.

This is worth noting: wit's controll'd by dulness; [sic]

The deepest thought can scarce be said in fullness;

Elixir to the blood of two or three,

Poison to lives of common men 'twould be.

III.

Earth's night is where she rolls

In her own shade;

And even thus the Soul's Dark

hour is made.

IV.

O Heroes, ye comfor[t] my brotherly heart!

O Scoundrels, too often with you is my part! V.

A man who keeps a diary pays Due

toll to many tedious days;

But life becomes eventful, then His

busy hand forgets the pen. Most

books, indeed, are records less

Of fullness than of emptiness.

VI.

In a deeper sense than the common

A skeleton typifies Death, Death

being the bones of a fact,

Wanting the blood and the breath.

## VII.

Virtue's Toleration

Is sweet as flowers in May;

Vice's Toleration

Has a perfume of decay.

While earlier poems such as *Food or Work* emphasise the moral and economic dimensions of the crisis, linking the workers' struggles to global justice and the moral imperatives of solidarity, *Harben's Love Song* shifts the focus to innovation and the potential for reimagining resource use during times of scarcity. This poem embodies the entangled relationship between labour, industrial processes, and the environment, suggesting a creative yet precarious attempt to adapt to the realities of resource depletion. The poem provides an intriguing segue into the broader analysis of how Cotton Famine poetry reflects the interplay between industrial decline, resource scarcity, and the search for alternatives.

This poem thus invites a discussion of how alternative resource imaginaries emerge under pressure and how they reflect both the limitations and aspirations of Victorian industrial society. As such, it complements and deepens the analysis by adding another layer to the multifaceted responses to the Cotton Famine, connecting local labour crises to global resource dependencies and the creative, if fraught, attempts to resolve them. In this context, the poem aligns with the broader theme of sociotechnical imaginaries explored throughout this thesis.

While *Food or Work* critiques the Cotton Lords for their failure to provide immediate relief, *Harben's Love Song* (see below), illustrates how resource scarcity catalysed inventive efforts to sustain industrial production. The poet's invocation of *Zostera Marina* (a type of seagrass) as a potential substitute for cotton fibre highlights a shift in focus from moral obligation to the ingenuity required to navigate the crisis. This shift underscores how the Cotton Famine poetry

oscillates between lamenting systemic failures and imagining new possibilities, bridging the immediate struggles of workers with the broader ecological and industrial realities of the time. The poem *Threads* broadens the thematic scope of Cotton Famine poetry by weaving together industrial, ecological, and philosophical reflections. While poems such as *Food or Work* and *Harben's Love Song* engage directly with the immediate material and economic struggles of the Cotton Famine, *Threads* adopts a more abstract, yet deeply evocative, approach. It draws connections between the physical threads of textile production and the metaphorical threads of life, history, and human experience, situating the crisis within a larger cosmological and moral framework. This poetic lens complements the industrial and ecological critiques seen in other works by emphasising the interconnectedness of labour, materiality, and existential meaning. In the first section of the poem, the imagery of 'threads' encompasses the raw materials of industrial production (flax, hemp, cotton, and silk) while also gesturing toward their symbolic resonance as elements of human history and destiny. The idea that 'threads of life are twisted and wrought' links the material processes of weaving to the moral and existential construction of 'Character' and 'Fate'. This intertwining of the physical and the metaphysical reflects what Bruno Latour describes in *We Have Never Been Modern* (1993) as the entanglement of nature and culture, where human and non-human actors co-create systems of meaning and value. Similarly, Michel Serres' *The Natural Contract* (1995) argues that materials and natural processes are not passive but active participants in shaping human history, aligning with the poem's depiction of threads as both material and symbolic agents.

The subsequent sections introduce a philosophical tone, shifting from the concrete to the conceptual. The notion that 'Earth's night is where she rolls in her own shade' mirrors the cyclical nature of light and darkness, production and decay, resonating with Victorian thermodynamic anxieties. As Ruth Levitas discusses in *The Concept of Utopia* (2013), industrial and ecological crises often inspire a blend of lament and imaginative reconstruction,

where poetic forms like this can articulate both a critique of the present and a vision of interconnectedness. Entropy, as a metaphor for decay and disorder, lurks in these lines, reinforcing the poem's meditation on the fragility of human and industrial systems. The juxtaposition of 'Heroes' and 'Scoundrels' and the reflections on virtue and vice highlight the moral dualities that underpin both personal and collective histories, echoing the moral critiques found in more direct famine-related poetry such as *Food or Work*.

This philosophical abstraction also connects to the sociotechnical imaginary of the Cotton Famine. The poet's reflection that 'Most books, indeed, are records less of fullness than of emptiness' ties to the absence left by halted production - a literal emptiness in the mills and an existential emptiness in the workers' lives. Simon Rennie, in *The Poetry of the Lancashire Cotton Famine* (2020), highlights how Cotton Famine poetry often reflects not just immediate material struggles but also broader philosophical questions about the meaning of work and the human condition. Similarly, Andreas Malm, in *Fossil Capital* (2016), links the vitality of industrial systems to their energy flows, suggesting that the 'skeleton' in the poem symbolises the lifelessness of dormant machines, reinforcing the dependency of human and industrial vitality on continuous energy consumption.

In this way, *Threads* complements poems like *Harben's Love Song* by framing industrial materiality not just as a site of production but as a profound, interconnected system of ecological and moral relationships. While *Harben's Love Song* gestures towards creative responses to resource scarcity, *Threads* delves into the broader philosophical implications of these crises, contemplating the deeper entanglements between labour, materiality, and existence. As Timothy Morton's *Hyperobjects* (2013) suggests, such entanglements challenge the boundaries of human-centric narratives, framing energy and material systems as entities with their own agency and temporality. This multifaceted perspective enriches the broader analysis of the Cotton Famine poetry by highlighting how the genre moves fluidly between

immediate material concerns and universal existential questions, offering a rich tapestry of reflection on the intertwined crises of industry, nature, and human morality.

These two poems are marked by their materialities, which highlight the several scientific discourses of the time about resourcefulness. In *Harben's Love song*, the unknown poet calls for replacing cotton with dried eelgrass (*zostera marina*), a material used to stuff mattresses in the nineteenth century (Cotton Famine Poetry), to revive the industry. The poem uses a motif common in the Cotton Famine poetry, the image of the silent, still steam engines alongside the lack of labour. The sense of an entropic narrative is palpable, as there is a sense of degradation which constituted the biggest fear in Victorian sentiments about thermodynamics. This is also reflected in the uneven, irregular form of the poem. The stanza construction varies greatly. As Tina Choi argues, 'The nation that could somehow contain its own losses and transform them back into resources approached a self-sufficiency that could be seen as, alternatively, a triumph for England, an achievement of utilitarianism, or a decisive blow to Malthusianism' (2007, p. 308). In both poems *Harben's Love Song* and *Threads*, we can see how different raw materials could be utilised to maintain order in the world. In *Threads* specifically, the recounting of the materials spun in the mills also denotes feelings of pride in various elements of life, and the ways this spinning is analogous to making actual history. If we see the first law of thermodynamics as the mills working and the second law as what followed after they closed, we could see how the poem represents these two different aspects, conservation, linking it to nationalistic pride and morality, 'Threads of life are twisted and wrought; We are weaving Character, weaving Fate'), whereas in the last two verses the poem becomes decidedly dark and evokes images of entropic disorder and decay, 'A skeleton typifies Death, Death being the bones of a fact'. And while the first poem might have a slightly satirical character, regarding finding a substitute for cotton, the second one laments the loss of industry and likens it to death. Talking about systems in the 19<sup>th</sup> century, Michel Serres points out that

with the Industrial revolution there is a shift towards theories of heat. Serres calls mechanical systems statues, to highlight their rigidity, or a tendency towards creating an equilibrium. Serres argues that with the second law this fixity in time changes, as soon as they are built, they are designed to start their descent towards an end. Since models like the first part were commonly adopted by philosophers in the nineteenth century, he finds it curious that ‘Almost all of them attempted to find some failing with it: *they wished, I believe, that the motor would never stop.* With very few exceptions, almost all of them maintain, for example, the existence of an eternal return, despite findings to the contrary in physics (*The Origin of Language*, 1982, p.114, emphasis mine).

The poem *Oh! Ring The Factory Bell!* by J.B.L., published in the *Preston Guardian* in May 1862, epitomises these deep emotional and material anxieties of the working class during the Lancashire Cotton Famine. Through its repeated refrain, the poem captures the longing for the return of industrial rhythms, symbolised by the ringing of the factory bell, which had once been the defining marker of the workers’ daily lives. What was once resented as a ‘slumberknell’ is now reimagined as a symbol of stability, community, and economic survival. This shift underscores the profound disorientation caused by the cessation of work, which left families not only in material destitution but also in an existential void as their labouring routines were upended.

The poem aligns closely with the themes of this thesis, particularly in how it foregrounds the sociotechnical imaginaries of the working class and their entanglement with industrial infrastructure. The factory bell is more than a mere marker of time - it represents the connective tissue of industrialised life, linking individual labour to broader economic and social systems. Its silence reflects not only the collapse of industrial order but also the cascading effects of this rupture on domestic spaces, relationships, and emotional well-being. The imagery of bare shelves sold furniture, and a once-beloved rose poignantly illustrates the tangible and

symbolic losses endured by the working class, while the physical and emotional toll on the speaker's family reflects the entropic unravelling of a system once held together by industrial regularity.

*Oh! Ring The Factory Bell!*

Oh! ring again that factory bell,  
That once awoke the morn;  
I used to hate that slumber-knell,  
And deem my lot forlorn,  
But now I listen for that sound,  
The hours I vainly tell,  
And think what joy would spread around,  
To hear the factory bell.  
I sit and look into the grate,  
White ashes cold lie there;  
One shelf contains an empty plate,  
And all the rest are bare.  
A broken box is now my seat,  
Our chairs we're forced to sell; And  
sold are all my pictures neat –  
Oh! ring that factory bell!  
We reared a rose, my wife and I;  
'Twas on our wedding day; We  
brought it; she wept bitterly  
To see it ta'en away.  
The books, too, I had read to her,

When all seemed bright and well,  
Go, one by one, 'tis hard to bear – Oh!  
ring that factory bell.  
I see my children day by day  
Grow paler and more sad,  
And look quite faint amidst their play –  
It almost drives me mad.  
My wife stands sighing at the door,  
I see her bosom swell,  
And find her tear-drops on the floor –  
Oh! ring that factory bell!  
(Preston Guardian May 17, 1862, J. B. L)

The poem's melodramatic tone, typical of Victorian labouring-class poetry, amplifies the sense of despair while also serving as a performative outlet for expressing collective grief and solidarity. As John Goodridge (2017) notes, many labouring-class poets of the period used performative and highly emotional rhetoric to reflect the precarious realities of their communities, blending personal narrative with broader social commentary. Here, the repetition of the refrain 'Oh! ring that factory bell!' becomes a poignant plea for the restoration of order and livelihood, encapsulating both the material dependency on industrial systems and the emotional weight of their absence.

In the context of thermodynamic imaginaries, the poem metaphorically navigates the laws of energy: the ringing bell embodies conservation and continuity, while its silence signals entropy and disorder. The imagery of 'white ashes cold' in the grate echoes the cessation of the energy flows that once sustained both factory and home. By positioning the factory bell as the central

motif, the poem captures the intimate connections between industrial systems, domestic life, and emotional stability, highlighting the broader implications of industrial collapse on the working class and their place within Victorian energy cultures.

This poem makes a plea for the opening of the mills, by repeating the line ‘Oh ring the factory bell’, to highlight a pre-famine work routine, and of what immense importance was that sound to the workers’ livelihoods and their families. It is suggested that the poem’s inspiration was a conversation with an unemployed mill operative (Rennie, 2017), and its themes centrifuge around previous industrial everyday life and the present desolate domestic life. These themes run throughout the Cotton Famine poetry, and they embody a legacy of industrialised England of the mid-nineteenth century. According to John Goodridge (2017) by 1860 there were many labouring-class poets that used dialect form and local materials to express both their class particularities but also represent communities in hardship and precarious states. As he argues,

It is important to stress the performativity of many labouring-class poems of the period, not just to try to find a fresh perspective on the seeming excesses of Victorian melodramatic poetry, but also because so many of the labouring-class poets in the period found outlets in performance (Goodridge, 2017, p. 534).

The melodramatic tone of many poems in Lancashire was quite common amongst Victorian labouring poets, and while contemporary critical responses to such explicit displays of raw emotion might not be very positive, they were an integral part of the poetic schema of the time. This tone served several functions, particularly for working-class communities navigating the rapid industrialisation of the 19th century. By dramatising the emotional and material upheavals of their lives, these poems created a space to process and articulate the profound anxieties and uncertainties brought about by industrial capitalism.

Melodrama was an effective tool for addressing these upheavals because it allowed poets to amplify the emotional weight of their experiences, making their struggles visible and

resonant within their communities. This expressiveness tapped into a collective yearning for stability in an era marked by technological, economic, and social transformations. Furthermore, through their dramatic depictions of industrial precarity and loss, these poems provided a framework for understanding the thermodynamic realities of their time - conservation, entropy, and energy's inevitable dissipation - mirroring the broader cultural tensions between progress and decline. In doing so, the melodramatic tone became not only a stylistic choice but a means of making sense of an epoch defined by profound instability.

## Conclusion

It seems that there are valuable lessons to be learnt by critically examining lesser-known literary outputs written during the first extended economic crisis in one of the nineteenth century's hallmark British industries at the time, the cotton industry. The two laws of thermodynamics appear to have sustained and provided the foundation for the ways certain beliefs can influence scientific discovery, although discovery in the framework of the nineteenth century Victorian Britain is loosely applied. As Cara Daggett observes, 'One might say that energy is always conserved because we merely expand the definition of energy to include what is lost. The laws of energy are semantic entities as well as responses to natural forces' (2019, p. 65). The term 'discovery' is loosely applied in the context of Victorian Britain because the development of thermodynamics was deeply intertwined with cultural, industrial, and moral frameworks rather than being a purely objective revelation of natural laws. As Cara Daggett (2019) notes, the laws of energy are 'semantic entities', shaped as much by cultural narratives as by natural forces. The formulation of thermodynamic principles was influenced by the industrial need for efficiency, the moralisation of conservation as a virtue, and the religious overtones equating waste with sin. These laws were not static truths but adaptive constructs, expanding to include concepts such as entropy and reframing loss as part of conservation. This pragmatic and

interpretative process highlights that ‘discovery’ in this era was as much about constructing systems that aligned with prevailing ideologies as it was about observing the natural world, blending empirical science with the moral and utilitarian priorities of Victorian society.

The Cotton Famine poets demonstrate that thermodynamics was not only a scientific framework but a cultural idiom through which crisis was narrated. Their verse registers how the steam engine, coal, and stoppages in production reordered social life and reshaped moral imagination. Energy became a language for articulating hunger, idleness, providence, and endurance, embedding abstract laws in the rhythms of everyday survival.

In the chapters that follow, I turn to contemporary drama in Lancashire and Manchester to trace how these thermodynamic trajectories persist and are reconfigured. Like the poets of the 1860s, today’s playwrights grapple with the cultural weight of energy systems, exploring through performance the entanglements of infrastructure, community, and imagination. Reading these works alongside the Cotton Famine archive allows me to examine how energy metaphors continue to shape the stories people tell about their environments, their futures, and themselves.

## *Chapter Two: Contemporary Theatre, climate futures, and the afterlives of Thermodynamics*

### From Victorian Thermodynamics to Contemporary Energy Narratives

In the previous chapter, I explored how Victorian thermodynamic ethics, as reflected in Cotton Famine poetry, moralised energy systems by framing conservation as virtuous and entropy as sinful. These cultural and material entanglements documented the crises tied to the emergence of fossil-fuel industries, reflecting not only the immediate struggles of the 19th century but also broader anxieties about industrial dependency and moral order. This chapter shifts the focus to contemporary theatre, examining plays written and performed in Lancashire (including Manchester) and Cumbria (*North Country*, *Keeping the Lights On*, and *Ergon: The Wicked Problem*) to trace how thermodynamic ethics persist, evolve, and are challenged in modern sociotechnical imaginaries. In analysing these productions, my emphasis is on dramaturgical analysis of performance (how staging, participation, and audience interaction configure meaning) rather than on script summaries or inferred authorial intention. This approach situates the plays within performance scholarship that treats theatre as embodied practice and social event (Taylor, 2003; Kershaw, 2007), rather than as literature alone.

The decision to focus on these plays, stems from their regional specificity and their engagement with the energy histories of Lancashire and Cumbria. As explored in the previous chapter, these areas were pivotal to Britain's industrial revolution and the development of fossil-fuel economies. Today, the region's transition from an industrial hub to an 'Energy Coast,' marked by renewable projects, nuclear facilities, and debates over resource extraction, offers

fertile ground for examining sociotechnical imaginaries. Plays such as *North Country*, *Keeping the Lights On*, and *Ergon: The Wicked Problem* reflect the region's historical entanglement with energy systems while grappling with contemporary concerns about energy transitions, environmental crises, and community resilience.

These narratives offer a counterpoint to centralised decision-making, amplifying voices from communities on the periphery of political and economic power. In this way, the plays contribute to what Michel Callon (2005) describes as the co-production of meaning through socio-technical arrangements. By situating their stories within specific landscapes and histories, these works illuminate the relational dynamics between human and non-human actors, challenging reductive narratives of resilience and control. Before moving into analysis, this chapter first provides short overviews of the plays under discussion—*North Country*, *Keeping the Lights On*, *Fusion*, *Tidelands*, *Things We Hear When We're Not Listening*, and *Ergon: The Wicked Problem*. These summaries establish their narrative contours, regional settings, and thematic orientations. This prevents the need for repetition later: in Chapter 3, I return to these plays but build directly on the overviews here, developing a dramaturgical analysis that focuses on performance as event rather than on script alone. By ‘dramaturgical analysis,’ I mean attention to performance as it unfolds in practice: staging, scenography, sound, actor–audience dynamics, and the circulation of affect in the theatre space. This distinction is important, as existing scholarship often emphasises authorial intention or textual content, whereas my focus is on theatre’s performative capacities to embody and reframe energy imaginaries in situ.

### *North Country*

The regional setting of *North Country* by Tajinder Hayer (2016), firmly situates it within the broader sociotechnical imaginaries of energy, resilience, and community that are central to this

chapter. Like the *Cotton Famine poetry* examined earlier, the play captures the lived experiences of communities navigating systemic collapse. Set against the backdrop of post-plague survival in Northern England, *North Country* engages directly with the legacies of industrialisation and the Anthropocene's challenges. It frames energy regimes not as abstract systems but as deeply personal and relational experiences. Tajinder Hayer's *North Country* unfolds across three distinct temporal settings (2016, 2028, and 2058) depicting a post-pandemic Northern England grappling with collapse and recovery. The narrative follows three characters: Alleyne, a rural farmer navigating isolation and authority; Nusrat, a young woman turned leader of an urban community; and Harvinder, a reluctant medic improvising care in the wake of systemic collapse. The play intricately weaves their lives through cycles of crisis and adaptation, revealing competing visions of survival and resilience.

In its initial scenes, *North Country* depicts the outbreak of a global plague, which decimates populations and ruptures societal infrastructures. Alleyne's father succumbs to the illness, leaving him to manage the farm and its dwindling resources. Nusrat loses her mother and assumes leadership of a group of survivors in Manningham, balancing their survival with the challenges of xenophobia and intercommunal tensions. Harvinder, the son of doctors, inherits his parents' vocation as a healer and grapples with the moral and material limits of care in a fragmented world.

The middle section shifts to 2028, exploring the fragile alliances and simmering tensions among the characters and their communities. Alleyne becomes the authoritarian head of a patchwork agrarian economy, enforcing rules to maintain order but facing challenges to his authority. Nusrat consolidates her community into a self-sufficient cooperative, embodying an ethic of mutual aid and resilience. Harvinder bridges these worlds as a traveling medic, providing care and attempting to mediate conflicts. By 2058, the characters are older, and their trajectories reflect the long-term consequences of their choices. Alleyne, frail and reflective,

contemplates his legacy while remaining tethered to his land. Nusrat, now called the Begum, has turned her enclave into a thriving hub of trade and culture. Harvinder, a solitary figure, documents the history of their region, symbolising the enduring tension between memory and survival.

The initial acts of the play, where characters grapple with the plague's immediate impact, mirror historical anxieties around the collapse of thermodynamic systems. Alleyne's rural isolation, Nusrat's role as a *de facto* leader in an urban enclave, and Harvinder's improvised medical practice demonstrate how survival relies on human and non-human assemblages. These narratives critique the essentialist binaries of rural versus urban, human versus machine, and chaos versus order, which were central to Victorian thermodynamic ethics and persist in contemporary energy discourses.

The episodic radio plays of *Keeping the Lights On* focus on the lived experiences of communities grappling with energy shortages and infrastructural fragility. By using soundscapes to evoke the materiality of energy crises - blackouts, storms, and failing power grids - the plays highlight the entanglement of human and non-human agencies. This fragmented format mirrors the uneven and unpredictable nature of sociotechnical transitions, offering a mosaic of perspectives that resist the linearity of thermodynamic ethics. The series foregrounds working-class narratives, emphasising the emotional and material toll of energy precarity while critiquing dominant resilience frameworks that prioritise technological solutions over systemic change.

### *Fusion*

Written by Maeve Larkin, *Fusion* (2020) follows a tense interrogation between a police officer and a 15-year-old asylum-seeking Muslim girl after she is accused of creating a nuclear reactor in her school. The officer's assumptions of terrorism clash with the girl's scientific ambitions

and her trauma as a refugee fleeing climate-induced devastation. The play weaves themes of scientific inquiry, cultural misunderstanding, and climate justice, highlighting the girl's desperation to combat a warming planet with fusion energy.

### *Tidelands*

*Tidelands* (2020) by Tajinder Singh Hayer explores the intersection of grief, community, and environmental adaptation. Seline, a teenage refugee from Barbados displaced by a hurricane, struggles with the trauma of losing her mother to the ocean. She forms an unlikely bond with Moira, an older woman in Morecambe, who invites her to join community allotments and later to walk across a tidal barrier built to harness renewable energy. The tidal causeway becomes a space of healing and reflection, blending the personal and planetary scales of loss and regeneration.

### *Things We Hear When We're Not Listening*

*Things We Hear When We're Not Listening* (2020) by Deborah McAndrew is a layered domestic drama that explores the intersecting themes of familial relationships, environmental ethics, and the psychological impacts of climate-adjacent technologies. Janet, a woman in her late 50s, is distressed by infrasound from nearby wind turbines, which she believes is causing her health issues, referred to as 'Wind Turbine Syndrome' (WTS). Her daughter Claire, a molecular biologist working on climate-related research, is sceptical but conflicted about prioritising green energy over individual well-being. The play juxtaposes personal experiences with global environmental concerns, questioning the costs of sustainable progress and the validity of subjective experiences.

### *Ergon: The Wicked Problem*

Set in 2061, *Ergon: The Wicked Problem* unfolds as a participatory courtroom drama in which the audience acts as jurors in the trial of Alex Hummel. Accused of ecocide under the Ergon Clean Energy Act, Alex's crime is clear: reactivating a coal-powered plant to provide energy for his struggling community in Moston. The audience/jurors must decide whether Alex's actions, which alleviated local suffering but violated climate laws, were justified. The play's narrative integrates testimonies from diverse perspectives, including a Bangladeshi woman recounting climate devastation, a displaced Los Angeles pop star, and Alex's own daughter, who describes her family's struggles under Ergon restrictions. These accounts illuminate the complex intersections of global climate injustice, individual morality, and systemic oppression. The climactic deliberation forces the audience to weigh up conflicting values - survival, community, and ecological integrity - before issuing a verdict on Alex's fate. *The Wicked Problem* interrogates the intersection of ecological sustainability and socioeconomic inequality, zeroing in on the ethical complexities of finite planetary resources.

### Staging Thermodynamic Ethics And Climate Justice

The following section turns to *Ergon* in the beginning of analysis of stage productions to examine how contemporary theatre interrogates the legacies of thermodynamic ethics within the context of climate crisis. Building on the genealogy established earlier, from Victorian debates on energy discipline to modern sociotechnical imaginaries, this play dramatizes the ethical, political, and ecological stakes of energy systems in transition. Through Alex Hummel's illegal reactivation of a coal plant, the play dramatises the persistence of thermodynamic ethics, which I have traced from Victorian debates about energy discipline through to contemporary imaginaries. While Georgescu-Roegen (1971) later articulated this argument in economic theory, insisting that all human and social activity is constrained by entropy and irreversible

energy loss, the play stages a similar confrontation: the fantasy of reviving redundant infrastructures collides with the ecological limits that make such projects untenable. In this sense, Hummel's action resonates with the broader genealogy developed in this thesis, where cultural texts expose the moral and material consequences of disregarding thermodynamic constraints. The Ergon system, while ostensibly addressing the climate crisis, exacerbates inequalities by disproportionately burdening vulnerable communities such as Moston. This reflects Robert Bullard's argument that environmental justice requires equitable distribution of benefits and harms, a principle systematically ignored in the play's dystopian future (Bullard, 2000). Alex's plight illuminates how 'clean' systems can perpetuate injustices, forcing marginalised communities into morally fraught decisions. Climate change exemplifies a 'wicked problem,' a concept introduced by Rittel and Webber (1973) to describe multifaceted issues lacking definitive solutions. The play embodies this complexity, portraying Alex's actions as morally ambiguous within a collapsing system. His defiance of the law raises questions of agency and accountability, drawing on Dale Jamieson's argument that traditional ethics are insufficient for navigating the Anthropocene (Jamieson, 2014). The jurors' deliberation mirrors this ethical tension, grappling with global accountability versus local survival, underscoring the fractured nature of climate responsibility in an interconnected world.

Building on the genealogy traced earlier, Victorian thermodynamic ethics, what Choi (2007) identifies as the moral coding of conservation as virtue and entropy as waste, established binaries that have shaped energy discourse well beyond the nineteenth century. These moralised frameworks persist in contemporary imaginaries, but the plays analysed here actively subvert them. *Ergon* (2020) refigures entropy as a relational dynamic rather than a moral lapse; *North Country* (2016) exposes the limits of resilience discourse, which celebrates adaptation while ignoring systemic inequities; and *Keeping the Lights On* (2020) emphasises the distributed character of energy systems, resisting narratives that centre agency in human will or

technological fixes. Taken together, these works extend and complicate the thermodynamic ethics examined in earlier chapters, showing that cultural production not only reflects energy imaginaries but actively redefines the ethical frameworks through which transitions are imagined, contested, and made possible. By presenting energy systems as dynamic assemblages of human and non-human actors, these plays align with Michel Callon's observation that 'socio-technical arrangements have the capacity to act and give meaning to action' (2005). This perspective shifts the focus from human attempts to control energy systems to a recognition of their interdependence and complexity. It also underscores the potential of theatre to mediate between lived experiences and abstract energy regimes, creating spaces for critical reflection and collective meaning-making.

Theatre's performative nature makes it a particularly effective medium for exploring the complexities of energy and climate futures. Unlike fiction, which often centres individual protagonists, theatre inherently involves communal production and reception. Plays such as *North Country*, *Keeping the Lights On*, and *Ergon* leverage this communal aspect to engage audiences in dialogues about energy transitions and environmental crises. By situating their narratives within specific local contexts, these works not only critique existing sociotechnical systems but also imagine alternative futures grounded in community and relationality.

This performative dimension resonates with New Materialist and Actor-Network theories, which emphasise the distributed agency of material and social systems (Barad, 2007; Latour, 2005). The plays create opportunities for audiences to engage with these dynamics, bridging the gap between 'hard' scientific data and the lived realities of energy precarity. They also challenge the exclusionary nature of dominant narratives, amplifying voices from marginalised regions and working-class communities to offer more inclusive and equitable visions of energy futures. By underscoring their stories in Lancashire and Cumbria, *North*

*Country*, *Keeping the Lights On*, and *Ergon* highlight the enduring influence of Victorian energy imaginaries while reimagining them for contemporary crises. These plays critique thermodynamic ethics and resilience discourses, emphasising the relational and interdependent nature of energy systems. They also foreground peripheral and working-class perspectives, challenging dominant frameworks that marginalise these voices in discussions of energy transitions and climate change.

Through their engagement with sociotechnical imaginaries, material agency, and regional specificity, these plays contribute to a broader discourse on energy and environmental futures. They demonstrate the potential of theatre to act as a mediator between cultural narratives and systemic change, offering a powerful lens to examine the entangled challenges of the Anthropocene. A discourse about climate and energy futures cannot be viable without the input from human and non-human agentic properties and material iterations. The theatre narratives I examine involves researching evidence and combining them with ‘human dramas’ (an expression that one of my participants used in our interview) to create instances of meaning making as they engage the spectator/reader in an emotional, familiar way. Weather events and their temporal immediacy offer sociotechnical imaginaries both on a policy but also on a medium level because they are so grounding in their magnitude. These events highlight the different trajectories of excess and surplus, materialities that cannot be contained, such as excess precipitation, excess heat, excess radioactive waste, causing a schema of subsequent excesses, like tonnes of landfill waste, or building infrastructures to bury nuclear waste underground. Excess and scarcity are familiar tropes in dystopian narratives about the future, but the narratives I am interrogating do not offer easy solutions. Narratives that address energy regimes and climate change and are situated within a geographical locale where they are conceptualised offer multiple entry points into the complexities of the problem and act on both

affective beyond their representational potential. They offer a lexicon and coherence and various modalities of futures landing them onto the geophysical histories they are occupying. We need to enquire where these instances of narrative production are taking place, within what spaces and who has access to them. This kind of critique is largely absent when discussing the role of literary narrative in communicating energy and climate futures. We need to pay closer attention to past and possibly forgotten narratives of human/material interaction but also peripheral narratives that bring out voices far away from any decision-making centres and shed light to the ways we can engage larger audiences.

New Materialism, as mentioned above, is a significant conceptual tool in my analysis, to show how works of imagination can construct material conditions (audiences watching/participating in a show, talking about the imagination behind it in narrative interviews) and offer a narrowed space to explore solutions to these problems. The imbrication of discourse and the material as a product of individual minds (Davoudi and Machen, 2022) to open ended questions of energy problems and climate change. As they argue:

Our understanding of the imaginary foregrounds its imbrication of material and discursive aspects and clarifies its relationship to ideas about image and imagination. As the envisioning capacity of a political collective, imaginaries exist in creative interplay with the imaginative products of individual minds. Its powerful and integrating qualities and its enhanced capacity can carry us forward, back or sideways, to move across space and time as well as to unknown worlds (2021, p. 330).

What Davoudi and Machen highlight and is relevant to my analysis, is the idea that an imaginary can be formed within an individual mind, albeit large planetary events like climate change deposit collective experiences (such as a massive flood, a prolonged heatwave), that is

gets embroiled in the collective imagination. In the instances of playwriting or writing fiction in general that translates into imaginaries that encompass the ways people embody climate change along with pre-existing ideas (conscious or subconscious) about the future that resonate with what I was discussing in the previous chapter. This line of argumentation aligns up to a point with David R. Cole's suggestion in his article 'Patchwork Vectors for the Anthropocene: The Role of Creative Ecologies', (2025) where he argues for a social enquiry into climate change informed by what he calls 'patchworks' a theory wherein acknowledges the complexities deriving from the issues surrounding climate change, namely the scientific facts with regard to it, but also the ways global capitalism addresses the social, economic and cultural aspects of it, creating thus a 'patchwork'. Cole argues that in respond to these flows of capital certain creative ecologies emerge as forms of resistance, bringing forward an example of a playground in Australia that uses UV Smart technology to allow for children's play in extended heatwaves.

Here, the plays are foregrounded as a mode of social and qualitative inquiry into how capitalism destabilises and 'deterritorialises' (Deleuze & Guattari, 1972), undermining social cohesion and ethical responsibility in its expansionist drive toward capital accumulation. In the context of climate change, this deterritorialisation resonates with the erosion of collective attachments to place, energy systems, and environmental ethics, revealing how the pursuit of profit fractures the very cultural and ecological foundations needed for sustainable futures. By staging these tensions, the plays illuminate how energy imaginaries are not only technological or economic constructs but also profoundly social and ethical struggles over belonging, justice, and survival.

Although there are certain valuable strands in the patchwork theory, what remains unclear is who has access to these niche local experiments as Cole calls them, and in what ways they could counter-act some of the capitalist vectors of growth within climate change, such as

greenwashing, retaining and persevering to fossil-fuelled energy regimes, and shifting resources away from local communities (deterritorialisation). The interplay between individual and collective narratives in envisioning post-apocalyptic futures, energy ethics, and environmental decay can reveal critical tensions in how dominant cultural discourses are replicated or resisted. Individual imaginations often draw upon diverse, personal experiences, allowing for freedom and deviation from prevailing norms. In contrast, collectives, while potentially unifying, can inadvertently replicate dominant narratives, particularly when prestige and established tropes shape their discourse (Latour, 2004). This phenomenon is visible in scientific and cultural outputs where authoritative paradigms infiltrate creative forms, perpetuating existing power structures and ideologies rather than challenging or diversifying them.

Drawing parallels with the 19th century's energy ethics provides an illuminating framework for understanding these dynamics. The Industrial Revolution, powered by coal and steam, heralded profound societal and environmental transformations. Ethical discourses of the time emphasised progress and mastery over nature, which were seamlessly woven into cultural products like literature, theatre, and art. These narratives often celebrated industrial power while marginalising alternative viewpoints or voices that questioned the sustainability or social cost of such progress (Szeman & Boyer, 2017). Similarly, in contemporary cultural imaginaries, dominant scientific tropes - such as techno-fixes to ecological crises - often overshadow more complex, intimate explorations of how individuals and communities experience energy depletion and environmental collapse.

Theatre, as a mobile and versatile medium, offers a counterpoint to this homogenisation of narratives. Its inherent ability for movement, both physical, as plays tour diverse locations, and conceptual, as audiences interpret its messages through varied cultural and experiential lenses, makes it a potent medium for fostering alternative perspectives. Unlike large-scale

media productions often shaped by hegemonic forces, theatre can engage directly with local and marginalised communities, creating spaces for dialogue and representation that subvert dominant tropes (Rebellato, 2009). For instance, plays designed to adapt to multiple formats, such as radio, online platforms, or live performances, extend their reach, bringing these critical narratives to both larger urban centres and smaller, more diverse communities. This mobility and adaptability allow theatre to challenge the conventions of mainstream climate fiction (cli-fi). The latter often focuses on solitary protagonists navigating hostile postapocalyptic landscapes, frequently emphasising survival through violence and competition. This focus not only reinforces individualistic and adversarial worldviews but also aligns with broader neoliberal ideologies that legitimise self-reliance over collective or systemic solutions (Nixon, 2011). In contrast, theatre can capture and disseminate stories that resist these patterns, spotlighting collaborative resilience, localised experiences, and imaginative departures from dominant cultural narratives.

As this chapter demonstrates, the plays examined here leverage theatre's intimate and communal nature to question entrenched ideas about energy ethics and environmental futures. By foregrounding personal and localised experiences within the broader context of environmental and technological crises, these works encourage audiences to reimagine futures beyond the constraints of dominant post-apocalyptic and energy narratives. Through their multi-modal adaptability and capacity for intimate connection, they provide fertile ground for a richer, more inclusive interrogation of the sociotechnical imaginaries that shape our collective response to ecological challenges.

Even though a play may be written by a single author, its actualisation is always collective: actors, producers, directors, lighting specialists, and other collaborators shape the work, while its execution necessarily involves another community; the audience. This collective dimension

is not unique to theatre. Poetry, particularly in the case I am examining where poems were likely performed as songs, also carries performative qualities. Like theatre, it generates interaction through live dissemination, creating spaces of exchange that extend beyond the page. This performative and communal orientation matters because it distinguishes theatre and poetry from fiction. Fiction is more tightly bound to the publishing industry, which can often be exclusionary and heavily dependent on commercial metrics. By contrast, theatre and poetry retain a certain flexibility: they circulate through performance, workshops, or local networks, enabling modes of participation that are less constrained by market logics.

This brings me to a crucial point in my argument. The genres I am analysing, plays and poems from specific geographical contexts, are anglophone but not canonical, and they are frequently authored by writers from working-class backgrounds. Their marginal positioning in the literary field is inseparable from the very qualities that make them significant: their communal production, performative dissemination, and resistance to exclusionary structures.

I am approaching these narratives from this aspect and posing class iterations of cultural narratives set against energy regimes, thermodynamic legacies, and climate change discourse. This mode of qualitative research can also shed some light into potential causalities of transitioning to more sustainable energy sources. By engaging their audiences, these plays create a space for meaningful and practical dialogues about energy and environmental futures. Building on my discussion of how theatre reconfigures thermodynamic ethics and environmental imaginaries, it is useful to situate these cultural practices within broader theoretical debates about order, disorder, and the circulation of knowledge. In *Chaos Bound: Orderly Disorder in Contemporary Literature and Science* (1990), Katherine N. Hayles examines how chaos theory developed in the physical sciences in the early twentieth century, moving away from universalising models toward frameworks that recognised patterns within

apparent disorder. Thermodynamics, biology, and statistics, she argues, all revealed that ‘new ways of thinking about erratic variations were revealing deep structures of order within the apparent disorder’ (Hayles, 1990, p. xiii). Crucially, Hayles shows that literature followed a similar trajectory: just as scientific discourses informed literary forms, so too did literature shape how science and technology were imagined.

This framing is significant for my analysis. It underscores that literary and performative texts are not merely secondary reflections of scientific discourse but active sites where ideas such as entropy, conservation, and resilience are tested, reframed, or resisted. Hayles’ insistence on the interplay between the local and the global is especially important here. She highlights how situated contexts reconfigure phenomena in ways that complicate or resist universalising frameworks. In other words, local narratives can expose the limits of systemic theories and generate alternative ways of knowing.

This perspective connects directly with Michel Foucault’s critique of ‘totalising theories’ in *The Order of Things* (1970), *The Archaeology of Knowledge* (1972), and *Discipline and Punish* (1977). For Foucault, claims to universal knowledge often mask disciplinary power, producing ‘regimes of truth’ that consolidate authority while marginalising other voices. Reading Hayles alongside Foucault highlights why it is vital to pay attention to cultural texts that emerge from peripheral, working-class, or regional contexts: they complicate dominant energy discourses, which continue to bear the imprint of Victorian thermodynamic ethics, and foreground the stakes of whose knowledge counts. By connecting Hayles’ account of chaos theory to Foucault’s critique of knowledge and power, I extend my genealogy of thermodynamic ethics into a framework for understanding how cultural production mediates between systemic, scientific discourse and localised experience. This allows me to show how the plays I analyse

both inherit and subvert Victorian energy ethics, creating spaces for new imaginaries of energy and climate futures to take shape.

However, Hayles presents a critical stance toward this perspective, arguing that local knowledge does not necessarily possess the emancipatory potential that it is often credited with, just as not all generalizing theories necessarily function as instruments of oppression. As she explains: ‘Many complex forms have smaller parts that are shaped like the object - a twig reproduces the shape of the branch, and a branch reproduces the shape of the tree. In these instances, the whole and the parts are related through self-similarity’ (Hayles, 1990, p. 217). I apply this analysis to explore whether the narratives I examine reproduce dominant theoretical frameworks or diverge from them in their visions of the future. This is not a critique of the individuals whose narratives I analyse but rather an inquiry into how post-apocalyptic narratives either reinforce or challenge beliefs established in the nineteenth-century North of England, and what the implications of these patterns are for contemporary discourses on climate change and energy futures.

### Reimagining Connection and Community in Post-apocalyptic Futures: North Country as a Counter-Narrative

The second play I examine is called *North Country* (2016) written by Tajinder Singh Hayer, and it was first performed by Freedom Studios in The Wild Woods, Bradford on 26 October 2016. Tajinder is a lecturer at Lancaster University, and his interview is included in the next chapter. The play follows the lives of three teenagers, Nusrat, Harvinder and Alleyene in the aftermath of a pandemic that killed off most of the world’s population. They navigate a post-apocalyptic environment in urban and rural Bradford with few resources left. The play uses familiar teleological tropes such as TV and power cuts, the end of newspaper printing, along with images

of riots, fires, looting and the acquisition of weaponry to survive in this new ‘wild’. Resources are to be extracted or stolen in order to survive. The protagonists also embody another trope of post-apocalyptic narratives, the younger people who are forced to become adults abruptly. The vision of the future offered in *North Country* is dystopian and appears to embed environmental futures that have been prevalent in public discourse about the potential end of humanity, integrating visions of the future that would be familiar to contemporary audiences. Science fiction has been widely recognised as a cultural site where sociotechnical imaginaries are articulated and circulated. For Jasanoff and Kim (2015), such imaginaries integrate technological projections with normative visions of social order, making speculative futures a way of working out what kinds of societies are desirable or undesirable. Building on this, Milkoreit (2017) argues that climate-oriented science fiction not only reflects public anxieties but also actively shapes political imagination by staging possible worlds and future trajectories. Taken together, these perspectives suggest that science fiction functions less as escapism than as a key discursive arena where energy and climate futures are made thinkable, debated, and contested. This is mostly true for climate fiction narratives as well, however in *North Country* it becomes very clear quite early on that it deviates from normative post-apocalyptic narratives and introduces alternative concepts that could be applied to visions of the future. The character of Nusrat, resumes a kind of leader for a group of people who form a community in the ruins of world that existed before the pandemic, and refers to the bonds that tie them beyond family relations:

We’re not blood kin, but I can connect most of us. There’s always a cousin’s cousin’s cousin; family friends; connection back in Pakistan. And I tell them - that’s going to keep us alive. Connection. When things got bad, it wasn’t just because people got ill; it’s because they stopped looking out for each other. I tell

em that each night like a bedtime story. And I tell em not to cry. Because we've cried enough. (p. 25).

Hayer makes a point of presenting ideas connected more with non-Western traditions of connection and community, departing from the individualist orientation that dominates most post-apocalyptic narratives. Such narratives, I argue, remain tethered to Protestant ethics of work, discipline, and productivity, where survival is framed as a moral duty carried out through individual labour and familial obligation. In many cli-fi texts and films, protagonists are cast as self-sufficient figures whose closed-system existence mirrors the Protestant ideal of conserving energy and restoring order against entropy. *North Country*, by contrast, offers a strikingly different vision of the future. Here, Hayer deliberately reimagines survival through non-Western and diasporic ethics of kinship. This contrasts with the Protestant-inflected ethic of self-discipline and productivity that, as I argued earlier, shaped thermodynamic imaginaries of energy as a closed system. In resisting this legacy, *North Country* reframes the post-apocalypse not as a solitary test of endurance but as a communal project of care and solidarity. The play's emphasis on community bonds that transcend blood relations unsettles the Protestant ethic of self-reliance, proposing instead a collective, relational model of endurance that challenges the moral economy of individual productivity and conservation. The three protagonists form a begrudging friendship by exchanging services and scarce goods, with fuel emerging as one of the rarest yet most indispensable resources. In this way, scarcity and abundance punctuate the apocalyptic world of *North Country*, structuring not only access to materials but also the rhythms of daily life. Yet unlike the Protestant ethic of self-discipline and individual responsibility, which often frames scarcity as a moral test, the play reorients survival around exchange, reciprocity, and care. In placing relationships rather than productivity at the centre, *North Country* embeds scarcity within non-Western and diasporic ethics of community,

where value is measured through solidarity and connection rather than the preservation of a closed system. Yet rather than casting scarcity as a test of individual discipline and self-sufficiency, as in many Protestant-inflected survival narratives, the play situates it within practices of connection and collective care. In this vision of the post-apocalypse, survival depends less on conserving a closed system than on cultivating bonds that extend beyond kinship. This emphasis on the ordinary, on food, fuel, and everyday exchange, becomes the ground where non-Western and diasporic ethics of community are enacted. It is within these everyday routines that the play locates its ecocritical force, foregrounding interdependence rather than individual heroism. This becomes particularly visible in a scene from March 2028, when Harvinder encounters a group of newcomers whose appearance evokes both memory and recognition. Dressed in familiar fabrics and turbans, they embody a cultural continuity that Harvinder longs to be part of, prompting him to abandon his survival instincts and immerse himself in this unexpected community.

There's about forty of them, and they're gently murmuring amongst themselves.

I think about hiding first, then I think about running, but then all those instincts that have kept me alive...disappear. Because I see them. It's the cloth. Blues, blacks, greys, even faded orange. Turbans. These are men wearing turbans. I haven't seen that in... And then I don't care that this is the moment I finally go mad. Because I'm running. Running down the hill to meet these ghosts. Running with all my heart. (p. 31).

Although meeting strangers signifies danger in a post-apocalyptic world, the characters' development in this play centres around connection that goes beyond family ties and more so extends, to the protagonists being brown and from an immigrant background, claiming the land

as their own. Another theme that permeates the play is a common one in post-apocalyptic narratives, and that is the ‘return’ to an agrarian, pre-industrial society. In the play as the years pass, a new mode of urban living, where the borders of what was once industrial and rural are blurred.

Harvinder: The lake formed in the town centre about thirty years ago. Should’ve seen it coming. The Bradford Beck’s been buried under the city for more than a century. Was buried. Because, with no one to keep the culverts clear and maintain the tunnels, it broke free. Partial freedom, anyhow. With all the collapsed sewers and the fallen masonry, it got stuck. Colonised Centenary Square first and then spread out to the Cathedral. Eventually it found its old riverbed by Canal Road, but the lake it made stayed in the town centre (p. 50).

These images beckon for the audience to think about familiar locations in trajectories that fuse what we call ‘nature’ with the mundane, everyday image of a city high street, in a future not far from the present. Reading or potentially attending a performance of *North Country* after the Covid-19 pandemic becomes poignant and eerily familiar, reminding us of the driving force of genres like SF to pre-empt futurities, especially when realism as a tool no longer serves as a critical lens through which to view late-stage capitalism. As Trish Reid argues: ‘They (the plays) do not reinscribe socio-political, or the status-quo, by pretending to be objective records of the real world. Instead, they create alternative near-future-worlds, that deliberately perform estranging critical interrogations of current social and political concerns’ (2017, p. 5).

If the Cotton Famine poetry was deeply rooted in its industrial reality and embodied the thermodynamic saga in both its ethical and material concerns, framing the cotton industry as a closed system to be conserved and shielded from dissipation, then post-apocalyptic narratives of the 2010s take on a different function. Emerging in the wake of the 2008 financial crash,

these works destabilise and estrange the everyday realities of fossil-fuelled capitalism and commodity overproduction. They expose how crisis, whether economic or ecological, interrupts the illusion of endless growth and stability. It could be argued that the vision of a world without resources recalls Victorian fears of ‘heat death’ and civilisational collapse, which haunt much post-apocalyptic fiction. Yet *North Country* diverges from this inheritance. Where the Cotton Famine poets sought to preserve the system against entropy, Hayer imagines its transformation: survival is no longer tethered to conserving industrial order but redefined through community, care, and connection. Rather than staging apocalypse as a totalising collapse or as a test of industrial modernity’s endurance, the play anchors its narrative in the ordinariness of everyday life—food, fuel, memory, care—and uses these to imagine survival otherwise. Crucially, this vision draws on feminist, non-Christian and diasporic ethics that emphasise relationality over individual self-discipline, reframing survival not as the preservation of a closed system but as the cultivation of solidarities across human and non-human worlds. This iteration of a post-apocalypse drama goes back to the theorisation of Lauren Berlant’s *Cruel Optimism* and attachments to the ordinary to cope with an ever-growing instable and precarious state of living. While the characters in *North Country* have to face immense, massive disruptive events, the focus is on the everyday ordinariness. The marked years 2028, 2058, bear an affective force onto the reader, as Hayer’s dramaturgy blends temporal ‘thickness’ with the feeling of uneasiness of trying to imagine the years up to 2050, which marks what scientists say would be the irreversible damage to the planet. Towards the end of the play, which is marked April 2058, the three main characters offer their closing thoughts on community, time, and memory.

Alleyne: At the start, I argued with Jamie to leave the school. But she tells me I don’t know what it’s like to pour myself into something. I tell her about the Manor, but she says that that’s not the same thing. Zameen, land, call it what you

want – that’s not the same as people. And, if you get used to people dying and you get used to not caring, then what’s the fucking point in them being alive?

Harvinder: You look out over this Borough, and it’s like the land has healed over the city. Scar tissue. But it doesn’t work like that, because my parents weren’t an injury on this land. What hurts is their passing – and I don’t forget that.

Nusrat: But forgetting’s a useful thing. Means you can get on with the present and the future. I remember Omar and everyone else in the morning; but then I get on with the rest of my day and put em back. I’m the Begum. Even though I’m old and I don’t move like I used to, ma folk still look up to me. I look up to me.

Hayer brings in conversation three distinct elements of the post-apocalyptic narrative, namely the notion of care, the state of the environment and the temporal dimensions of trauma following an acute crisis. As Reid states, ‘A growing awareness of these tensions is now reflected and inflected, I would argue, in the dramaturgy of a sizeable number of new plays. The recent dystopian turn in playwriting is a product of widespread uncertainty and anxiety in the aftermath of the 2008 economic crash and the subsequent crisis in neo-liberalism’ (2019, p. 170). In line with this argument, I want to add that this is also the result of fossil-fuelled capitalism, which poses a diffused yet constant pressure on societies and people. As we will see in the next chapter, Hayer admits drawing inspiration from the 2008 economic crisis, and borrowing elements of Science Fiction and dystopian narrative to engage critically with systemic oppressions and erasures of the ex-colonies’ immigrants in England.

The play is part of a wide range of anglophone media including fiction, TV series and films in the first decade of the twenty-first century that envision varying degrees of dystopian themes.

It can be positioned within a genre that borrows elements from science fiction but is more diversified in its contents, as in the familiar tropes of post-apocalyptic texts of nuclear war, highly advanced technological futures that radically change the course of civilisation and humanity as well as ‘threats’ from other planets. In recent media and literature alongside cultural studies scholarship, there seems to be mounting anxieties that include fossil fuel scarcity, environmental collapse and pandemics. *North Country* can be seen as the ‘smaller scale’, more localised version of Emily’s St. John Mandel’s *Station Eleven*, which also featured a strand of the flu called the Georgian flu that wiped out most of the world’s population. *Station Eleven* according to Méndez-García ‘suggests that, were humans to survive such an unprecedented crisis, the only hope to escape being feralised lies in a communal, continuous effort to recreate culture’ (2019, p. 111). In a similar vein, *North Country* is based on the foundation that community is the way forward in an energy and environmental crisis.

#### *Ergon: The Wicked Problem* as an Entropic Exploration of Climate Crisis

The next play that comprises my case study is *Ergon: The Wicked Problem* and was written and performed by Ergon theatre, a collective based in Manchester. The play was written by Robin Lyons and Noe Sebert and is set in the near future, in the year 2061 where the audience will take part in the trial of Alex, participating as all the lawful bodies, including jurors, and have to set the sentence. The crime for which Alex is charged for (it is made clear that the audience consider him guilty, albeit what is on trial is his ethics and morality), is that he led a group of

people in reactivating a coal factory, Agecroft power station, to provide electricity for his community in Moston and other surrounding areas in Greater Manchester. According to the introduction of the play:

This goes against the Ergon Clean Energy Act, a climate law preventing the use of non-renewable energy. We need your help (the audience) to decide what to do with Alex because this is the first time this law has been broken. You are not here today to debate whether or not Alex broke the law. Alex did reactivate the power station, and Alex did use the coal to do it. After hearing both sides, your role as jurors, will be to decide whether Alex should be punished for breaking this law or whether he should be allowed to return home. Did the end justify the means?

The play uses a variety of multimedia tools, such as video and audio installations, text, and interactive audience participation. The play also raises a number of issues about futurity, authoritarianism, climate immigration, and the disparities between the global North and the global South, while at all times the audience is made part of the processes unravelling on the stage, including them into the strands of causalities that construct the taxonomies of climate change and futures of scarce fossil fuels. British Theatre has been exploring environmental themes over the last 15 years or so, with scholars such as Una Chaudhuri and Enelow (2014) identify such work as ‘ecological theatre’ or, in some cases, as ‘climate-change theatre,’ a categorisation later taken up and expanded by Johns-Putra (2019). Theatre as a medium has the capacity, potentially, to make an impact on the ways people perceive energy materialities, and the complex ways of climate change realities as they are felt in different parts of the world. *Ergon: The Wicked Problem* invites active participation in mapping the emotional and experiential landscapes of climate realities, offering a rigorous exploration of responsibility and

accountability. It critically engages with the enduring inequalities between the global North and South (Nixon, 2011; Mbembe, 2003), highlighting the disproportionate impacts of climate change on vulnerable regions and exposing the systemic imbalances that perpetuate these disparities (Sheller, 2018). By situating capitalism as a driving force, the work interrogates its role in exacerbating class divides and intensifying ecological degradation (Moore, 2015; Malm, 2016). At the same time, it examines the lasting effects of both traditional colonisation and its contemporary manifestations, such as 'neo' or 'crypto-colonisation', which continue to shape migration patterns and displace communities, with climate change acting as a catalyst for these disruptions (Wynter, 2003; Patel & Moore, 2017). What distinguishes theatre from other cultural forms in this context is its performative immediacy: it not only represents energy and climate crises but also enacts them through embodied presence, co-presence, and collective witnessing. This enables theatre to act as a site where sociotechnical imaginaries of energy futures are not only dramatised but directly contested. *Ergon* can therefore be read as an example of what Lisa Woynarski (2020) terms *ecodramaturgy*: a mode of performance that insists on attending to the long temporalities and slow violence of ecological destruction. As she argues:

Stories of climate change are often anonymous and happen over timescales that are not compatible with our understanding of temporalities or human-centric narrative preferences or the political cycle or the media cycle. These images, narratives and stories also need to foreground the way slow violence of ecological destruction magnifies differences, oppressions and vulnerability and the power structures that underpin them (p. 5).

The play reflects this notion in its dramaturgy, incorporating aspects of a decolonising praxis. Through its structure, the play stages the narratives of people acting as 'witnesses' to the trial

of Alex Hummel, illustrating how climate change and its destructive consequences are entangled with social and political power dynamics, and how these stories of slow violence challenge conventional narrative frameworks. The prosecution makes an argument in support of the Ergon government laws and why Hummel needs to be convicted:

Bangladesh has lost 20% of its land because of flooding and over 20 million people have been made homeless. Climate refugees. They live with cyclones and winds tearing through their country at 200 miles per hour. In the cities they have food and water shortages. Overpopulation means resources are scarce, and there's been huge outbreaks of new diseases. This isn't a freak accident – this is because of climate change. This is because of industrialisation. This is because of countries like the UK spending years burning non-renewable energies, like coal and living unsustainably (...). I'd like you to hear from Bāccā', a local Bangladeshi Mancunian woman. She's going to speak to us about her mother Bhokul (p. 10).

Bāccā' goes on to recount her mother's experience and how she was born amidst a severe flood in Bangladesh that wiped out her village. As the trial progresses the audience gets to listen to both sides of the story, with Alex's daughter taking the stand and criticising the Ergon system as well as his neighbour Jack, who was part of Extinction Rebellion from 2020 to 2055. He supports Alex for going down in the coal mine in order to help their community from energy rationing. The defence in the play takes an approach that also offers a critique of class divide, and how the poorer communities suffer more under the Ergon regime. The story also involves the account of a fictional celebrity called Mama Creation who also became a climate refugee, fleeing wildfires from the West Coast of the US to the East Coast and then eventually to the coasts of Britain, where because of their fame they were treated differently:

No, I didn't get turned away, I'm here because I'm a superstar. Seems your soldiers in the sand were fans of mine. My face, my name, brought us freedom. Do you know how disgusting that makes me feel? When I know that all along the British coastline there are warehouses full of other people who tried to find safety. I'm grateful to be here. Safe. But I hate it. I hate it because it isn't home. I hate it because there isn't space to help other people who ran. And it's all our fault. America, Britain, we smoked the planet and forced people to flee their lands. We smoked 'em out. This man, Alex Hummel, he's a nostalgic melody that should have been forgotten a long time ago. Punish him (p. 21).

The juxtaposition of Alex Hummel's actions with Mama Creation's testimony underscores the multiple scales at which climate injustice operates. On one hand, Hummel embodies the desperation of working-class communities forced into impossible choices under conditions of scarcity and deprivation. On the other, Mama Creation's experience highlights the uneven protections afforded by celebrity, privilege, and global mobility, even within a collapsing ecological order. The play thus situates energy injustice within a wider matrix of class and colonial legacies, showing how the burdens of climate change fall disproportionately on the poor and the displaced while elites retain routes of survival. This intersection of local precarity with global inequality provides the backdrop for Hummel's testimony, which stages the entangled ethical, political, and ecological dilemmas that are central to the climate crisis. When the defence calls Alex Hummel to the stand, he narrates his experience with Ergon as one rooted in deprivation and dispossession: energy rationing left households without thermal comfort, families crowded together to survive, and jobs like his former role as a mechanic were deemed unsustainable. Like many others, he was pushed into the new regime of pedalling E-bikes to generate clean energy, a form of labour that is simultaneously necessary and degrading. His

story situates the audience in the lived precarity of energy transitions. The concept of a *wicked problem* (Rittel & Webber, 1973) is central to the play's framing: climate change resists definitive solutions, demanding choices where every pathway entails loss. This aligns with Timothy Morton's notion of *hyperobjects* (2013), phenomena that are 'massively distributed in time and space' and therefore exceed human comprehension. Climate change, as a hyperobject, manifests across scales and registers; extreme weather, economic instability, disrupted ecosystems, altered social practices so that making any attempt at resolution are deemed partial and compromised. By having Alex re-emerge as both defendant and performer, *Ergon* bridges these frameworks theatrically. The jury-audience is asked to decide his fate, but the question posed— 'should Alex Hummel be punished for what he did?'—is not really about one man. It forces the audience to confront their own entanglement in climate responsibility. As Morton suggests, there is no outside to a hyperobject: every action, passive or proactive, becomes part of the system. The play therefore blurs observer and participant, enacting the entrapment of living within wicked problems and hyperobjects.

This dramaturgical choice also resonates with the genealogy traced in earlier chapters. Where Victorian thermodynamic ethics cast conservation as virtue and entropy as failure (Choi, 2007), *Ergon* dramatises the impossibility of such binaries under conditions of systemic inequality. Hummel's crime, reviving a coal plant, embodies the persistence of fossil-fuelled infrastructures, but the trial shows how responsibility cannot be moralised at the level of the individual. Instead, climate accountability becomes distributed, collective, and structurally constrained.

Situating the play in this genealogy highlights its critique of fossil fuels not simply as outdated technologies but as enduring legacies of imperialism and class exploitation. Just as the Cotton Famine poetry reflected the entanglement of energy, labour, and empire in the nineteenth

century, *Ergon* revisits these themes under conditions of climate crisis. It underscores how the infrastructures of coal and empire continue to reverberate in contemporary imaginaries, particularly from peripheral vantage points such as Moston. Thus, *Ergon* operates as a microcosm of multiple theoretical strands (wicked problems, hyperobjects, and thermodynamic legacies) without resolving them. Instead, it stages their entanglement, making visible how climate justice is simultaneously ethical, political, and historical.

So, the question we're asking you today is: Should Alex Hummel be punished for what he did? You know, because we know that he did it for a reason, but we also know that what he did has and is impacting everybody and is part of a bigger puzzle. So, is he guilty or not guilty? There is no right or wrong answer. It's a wicked problem because we're asking you to decide on the climate crisis as a whole. Right? It's for you to decide. And today whatever decision you make, will be yours – by making a decision today, you're forming an opinion on the climate crisis – whether you have done so before or not.

At the centre of *Ergon: The Wicked Problem* lies the thermodynamic legacy of fossil-fuelled power stations. Like the Cotton Famine poetry, the play foregrounds the entanglement of energy, class, and ecology, exposing how fossil fuels have historically served imperialism and sustained Western prosperity. While in the Cotton Famine poetry these dynamics surfaced more indirectly, they become explicit and unavoidable in contemporary cultural narratives such as *Ergon* and *North Country*. Emerging from peripheral vantage points, these works both pay homage to the nineteenth-century urban topographies that shaped early ecological sensibilities and interrogate how ecologies can persist beyond conventional definitions of 'the environment.' Fossil fuels, often demonised as dirty or obsolete, did more than generate power: they fuelled

colonisation and imperial expansion, embedding inequalities that operated simultaneously from the top down and the bottom up. These complex entanglements cannot be dismissed, for they continue to structure the cultural and material conditions through which energy futures are imagined today. As Western ecological discourse constructed binaries like fossil fuels as ‘evil’ and sustainable sources as ‘good’, theatre emerges as a uniquely adaptive medium capable of exposing different iterations of capitalism, often through dystopian narratives. In doing so, it not only poses critical questions but also foregrounds perspectives marginalised within mainstream ecological thought. Consider Alex Hummel’s decision in *Ergon: The Wicked Problem* to reactivate a coal-fired power station: while it contradicts sustainability ideals, this act becomes a means of supporting a marginalised community lacking the resources to meet Ergon’s stringent ecological mandates, thereby acknowledging our profound, ongoing entanglement with fossil fuels. In historical parallel, 19th-century mill workers turned to poetry to seek aid and document their experiences following what can be viewed as the first major capitalist crisis in a fossil-fuelled economy. Across past and present, these cultural forms, from poetry to theatre serve to illuminate hidden socio-ecological dynamics and contest reductive binaries that have long dictated how we conceive of energy and the environment. As Lisa Woynarski (2020) argues:

This theorisation and articulation of ecodramaturgies resists totalisation. Rather, it focuses on complexity, entanglement, tensions, contradictions, and uneasily reconcilable ways of being and thinking. They are not intended to be descriptive; they are simply an attempt to advocate for diverse strategies across multiple forms. An ecodramaturgical analysis considers modes of viewing and making, narratives, values, politics, ethics and affect in process, production and reception (2020, p. 11).

Plays such as *Ergon: The Wicked Problem* can be read within the broader theorisation of ecodramaturgies, where drama becomes a site for engaging ecological entanglements and ethical tensions (Woynarski, 2020). While literary studies have long traditions of ecocriticism rooted in nineteenth-century Romanticism, theatre studies, as Theresa J. May argues in ‘Beyond Bambi: Toward a Dangerous Ecocriticism in Theatre Studies’ (2007), have been slower to confront material-ecological realities head on. May calls for a ‘dangerous’ ecocriticism that resists the tendency to aestheticise nature and instead foregrounds the systemic realities of global warming. Her insistence that ‘ecological issues, like the concerns central to feminism and postcolonial and multicultural theory, address injustices felt in the body, the body of experience, of community, of land’ (May, 2007, p. 101) resonates directly with my focus on peripheral narratives in the Northwest of England.

Where May calls for ecocriticism that insists on embodiment and social location, my thesis demonstrates how regional plays like *Ergon* and *North Country* do precisely this. They show how ecological crisis is not evenly shared but disproportionately borne by working-class and marginalised communities, a reality obscured when global warming is framed as a universal and unavoidable condition. In this way, my analysis extends May’s call: I argue that attention to regional and class-based contexts complicates the universalist frame of ‘climate change theatre’ and insists on its uneven burdens. My intervention is to show that such resistance is not only theoretical but already happening on stage, in plays emerging from Britain’s peripheries that dramatise ecological crisis through the lived experience of class, race, and place. As she argues:

Foregrounding the intersection of ecological and social injustice is a form of resistance in the face of rhetoric that continues to polarise the environment versus jobs, urban needs versus rural rights, and wilderness protection versus

resource development. In addition, the complex questions at this intersection interrupt the notion that environmentalism is the cause celebre of white privilege and helps expose the system that benefit from driving a wedge between, for example, communities of colour and wilderness preservation (p. 102).

This perspective clarifies how cultural narratives can challenge entrenched binaries, dismantling long-standing divides that capitalist and extractive regimes have upheld. In *North Country*, this argument finds tangible expression as protagonists articulate their experiences from an immigrant standpoint, thus embedding ecological critique within the lived realities of displacement, inequality, and forced adaptation. Similar observations arise in other works examined in this chapter, as they underscore the urgency of recognising intersectional injustices tied to environmental degradation. By attending closely to human-scale relationships and resource scarcities, and by accentuating the intricate entanglements of social and ecological systems, these narratives help cultivate new rhetorical and conceptual pathways for rethinking environmental futures beyond simplistic binaries or predetermined hierarchies. Theatre is not new to immersive techniques and interactive audience participation, but it is particularly poignant at this specific juncture regarding energy and climate change discourse. In 2014, a theatrical ensemble from Berlin presented a play entitled *World Climate Conference* ahead of COP21, the United Nations Climate Conference which took place in Paris in December 2015.

The audience were given the role of delegating countries and were informed of procedure and protocol by relevant experts. Their goal was to negotiate on behalf of the country they chose on issues of emission reduction and climate change policy, which was briefed to them by the experts. As the creators of *Ergon: The Wicked Problem* (2018), their German counterparts engaged their audience via corporeality and embodiment, which lends to the creation of a unique affect shared by said audience every night the play is performed. Angelaki's analysis of

Rimini Protokoll's Welt-Klimakonferenz shows how the piece eschews symbolic universals in favour of corporeal, materially situated participation. By foregrounding bodies 'at work' within the event's procedures, the production translates climate discourse into lived encounter, reframing policy simulation as embodied practice (Angelaki, 2019, p. 43). A similar affective environment was created when I took part as an observer/audience member of *Ergon: The Wicked Problem*, acting as a member of the jury, and having to discuss the fate of Alex Hummel within the group of fellow spectators that I was grouped with. I found that there was a great sense of responsibility weighing on us facilitating a conversation that was animated and serious. The audience that night found Alex Hummel innocent, embracing the complexity of the predicament he found himself in, and the multi-faceted ways climate change affects people, just as the audiences experiencing the *World Climate Conference* in 2014. In *Co-Mutability, Nodes, and the Mesh: Critical Theatre Ecologies – An Introduction* (2021), Martin Middeke and Martin Rüdellheimer propose the term 'critical theatre ecologies' to denote and encapsulate theatre's capacity to transcend disciplines, on the one hand by incorporating discussions in humanities about decentring humans to non-human organisms, exploring ruptures and power dynamics in postcolonial settings, but also knowledge deriving from technical sciences, that include statistics, quantitative methods of enquiry that enmesh in affective and cognitive capacities to transform knowledge and meaning-making processes into a new discourse that involves a series of human and non-human encounters. As the authors argue, 'It is a central gift of critical theatre ecologies and their transdisciplinary methods to explicate these interactions of rationality and emotionality, of inner world and outer world, of culture and nature, with particular urgency, diversity, and complexity, as they are already inherent in the aesthetic phenomena of text and performance' (Middeke and Rüdellheimer, 2021, p. 3).

The plays I examine in this chapter depart from a lived experience point of view, having shed, in a way, a shell, a potential ‘master’ narrative trope of their ‘bigger’ stage-led performances of their counterparts in London theatre productions. Consciously or unconsciously, there is a certain reproduction of master narratives such as a ‘hero’-centred or scientist protagonist that undergoes certain transformations in order to learn or unlearn practices and habits, even though ecological theatre operates mainly in the margins of big productions. There is a certain ‘freedom’ afforded to peripheral, ‘smaller’ productions to engage with an array of issues that align with the concepts of critical theatre and tend to the situatedness or rhetoric (Morton, 2013) and disrupt the more familiar tropes of performances by occupying spaces that are unsettling and unfamiliar. As Una Chaudhuri argues in ‘Anthropocenes/ Theatre and Climate Change’ (2014):

This is, in a nutshell, the task of contemporary eco-art: to relocate the human not only in relation to landscapes and species – as the old ecology did – but also to geologic time scales and geophysical forces. Climate change poses formidable obstacles to representation, but – by the same token – it also offers opportunities and new directions for the arts to bridge the gulf opened by the intellectual – even cognitive – challenges posed by the phenomena of climate change (Chaudhuri, 2014, p. 20).

Chaudhuri’s formulation resonates directly with my project’s concern with literary and theatrical representations of energy and climate. The plays I analyse—*North Country*, *Ergon*, *Tidelands*—do not simply stage human struggles with scarcity or survival; they re-situate human experience within broader temporal and material scales, where ecological systems, infrastructures, and geophysical forces co-determine the possibilities of life. In this way, they

enact precisely what Chaudhuri identifies as the central challenge of eco-art: representing human agency within the vastness of planetary processes.

Yet, as postcolonial and feminist critiques remind us, the category of ‘the human’ in the Anthropocene cannot be treated as uniform. Human agency in the Anthropocene era is deeply uneven, shaped by structural inequalities and legacies of colonialism. T. J. Demos (2016) critiques the Anthropocene as a universalising discourse that risks obscuring how responsibility and vulnerability are asymmetrically distributed. Industrialised, fossil-fuel economies of the global North are disproportionately responsible for carbon emissions, while marginalised and formerly colonised populations experience the severest impacts of ecological breakdown. Similarly, eco-feminist perspectives highlight how patriarchal orders tie reproductive, care, and labour economies to extractive regimes, exposing who is forced to absorb ecological risk.

The plays under discussion reflect these tensions: *North Country* disrupts Protestant-inflected ethics of individualism by foregrounding diasporic kinship; *Ergon* dramatizes how energy rationing compounds class divides and renders working-class communities more vulnerable; and *Tidelands* situates climate displacement in both the Caribbean and Northern England, underscoring how the Anthropocene cannot be disentangled from colonial histories and their afterlives. These narratives therefore reject the idea of a singular Anthropocene and instead stage differentiated Anthropocenes, where some lives are rendered precarious while others continue to benefit from extractive infrastructures.

This insistence on differentiation is crucial for my genealogy of thermodynamic ethics. As I argued in earlier chapters, Victorian debates cast energy in moralised terms, entwining Protestant ethics of self-discipline, productivity, and the regulation of closed systems. Contemporary eco-theatre both inherits and contests this legacy. In foregrounding non-Western ethics of connection (*North Country*), exposing systemic inequalities in energy infrastructures

(*Ergon*), and dramatising the uneven burdens of climate catastrophe (*Tidelands*), these plays expose the limits of a Protestant-thermodynamic framing of energy as a problem of conservation and control. They suggest instead that Anthropocene cultural production must grapple not only with planetary temporalities but also with the uneven histories of capitalism, imperialism, and patriarchy that continue to shape climate futures.

In this sense, eco-theatre exemplifies the dual representational challenge identified by Chaudhuri: bridging the cognitive gulf between human time and planetary processes while also refusing the homogenising category of ‘the human.’ My thesis therefore positions these plays as cultural laboratories where the Anthropocene is reimagined not as a universal condition but as a contested terrain shaped by inherited ethical logics, historical injustices, and alternative possibilities for community, care, and ecological survival.

Keeping The Lights On: Local Voices and Global Energy Crises In Lancaster And Morecambe

If the Anthropocene signals humanity’s entanglement with planetary processes, *Keeping the Lights On* localises these entanglements in the lived realities of communities in Lancaster and Morecambe. This series of plays exemplifies how global climate crises and energy debates materialise unevenly in specific places, refracted through local histories of labour, class, and infrastructure. Building on the genealogies of thermodynamic ethics and postcolonial critiques explored in the previous sections, these performances highlight how ordinary lives are disrupted and reshaped by the intersecting pressures of austerity, energy scarcity, and ecological precarity.

By foregrounding local voices, the series resists the abstraction of the Anthropocene as a universal human story. Instead, it situates climate and energy futures within the textures of everyday life in the North West of England. These plays thus continue the thesis’s broader argument: that cultural forms not only represent ecological crises but actively reconfigure the ethical and political frameworks through which they are understood.

Moving on to the next case study of this chapter, I focus on the analysis of a theatre production company based in Lancashire, called *The Ragged Edge*, who wrote and directed a series of radio plays in collaboration with experts in the energy field in the research and development phase in order to contribute to discourse about the climate emergency. In the next chapter, I present my qualitative data from the interviews with the creators and in this chapter, I will examine how these three radio plays raise issues with our energy attachments and what kind of imaginaries they present. The plays were inspired by the different energy sources found in the Lancashire area, namely nuclear power, wind turbines and tidal energy. The first play, *Fusion*, by Maeve Larkin<sup>1</sup> (2020) delves into the migratory experience of a young female fusion engineer, positioning the UK as a colonial power and what the repercussions are for a person from a former colony is and what this means for being a female scientist. The second play is by Debbie McAndrew entitled *Things We Hear When We're not listening*, (2020) and it tells the story of noise pollution from wind farms; the third is called *Tidelands*<sup>2</sup> (2020) and is by the

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<sup>1</sup> I was not able to reach the writer for an interview that would have been included in the next chapter.

<sup>2</sup> Although my conversation with Tajinder (Jatinder) Hayer (in the next chapter) centred on his earlier work, I only encountered *Tidelands* at a later stage of my research. By the time I had access to this script, my principal interview with him had already taken place, making it impossible to solicit his direct commentary on this newer piece. Nevertheless, *Tidelands* offers a valuable window into how Hayer's post-apocalyptic motifs and energy-related concerns have continued to evolve. The script demonstrates how he weaves themes of climate migration, tidal infrastructures, and personal loss into a fictional narrative that resonates with the questions raised in my broader study - namely, how regional communities grapple with shifting coastlines, precarious energy regimes, and histories of environmental injustice.

Despite not having the opportunity to interview Hayer specifically about *Tidelands*, I include it here because it speaks directly to the threads running through his earlier works: the disruptive power of climate-induced catastrophes, the ethical entanglements around energy solutions (such as tidal barrages), and the centrality of human relationships amid ecological change. In that sense, *Tidelands* further illuminates the recurring tension between local attachments and global crises, reflecting the wider arguments in this thesis about thermodynamic ethics and sociotechnical imaginaries. Although my analysis of *Tidelands* is necessarily based on close textual reading rather than direct dialogue with the playwright, this later addition to his oeuvre exemplifies the continued development of ideas he first articulated in our conversation - underscoring

woman recounts the specifics of how the tidal barrier came to be, and the impact it had on the community.

Fusion (Maeve Larkin, 2020)

The first play, *Fusion*, by Maeve Larkin (2020), delves into the migratory experience of a young female fusion engineer, positioning the UK as a colonial power and questioning the repercussions for a scientist from a former colony who must navigate gendered as well as racialised constraints. The framing of the play around fusion, a technology often cast as the ultimate ‘clean’ energy future, already signals an engagement with global inequities. Here, the promise of boundless energy is not abstract, but refracted through the story of a young girl, an immigrant, who finds herself under police investigation after accidentally blowing up her school in an attempt to build a fusion device.

The dialogue between the girl (F) and the police officer (M) stages a confrontation between rational, scientific reasoning and the affective weight of trauma.

F: -smarter than everyone else.

M: You need to stop saying that.

F: I am processing thoughts others can’t grasp.

M: Intellect isn’t everything you know. What about EI, emotional intelligence, the ability to feel?

F: Like emojis?

M: Eh?

F: All my feels have gone. I left them in the Calais Jungle.

M: I thought that closed.

F: 2016.

In this exchange, the adage of feeling vs logic is presented and the girl appears very confident in grounding herself as a scientist firmly in the side of logic. The police officer argues for the importance of emotional intelligence to which the girl rebukes that her feelings were left behind in the Calais Jungle, bringing the immigrant experience firmly into the world view of the play, highlighting the longstanding trauma of dislocation, uprooting and suffering of the immigrant subject. In this sense, *Fusion* resonates with Timothy Morton's concept of hyperobjects (2013). Climate change is a phenomenon that exceeds human comprehension, distributed across time and space in ways that defy capture. The girl's oscillation between scientific rationality and affective detachment dramatises this paradox: she is both inside and outside the problem, embodying the migrant subject caught between systemic violence and planetary instability. The play also reflects Trish Reid's insight that dystopian drama stages 'unwelcome futures' not to escape the present but to estrange and critique its underlying logics (Reid, 2017). *Fusion* positions the immigrant young woman as a figure who both embodies precarity and insists on urgent scientific intervention, rejecting the inertia of Western institutions that 'think they've got time because the death happens somewhere else.'

Thus, *Fusion* situates agency at the margins: the first-generation immigrant youth becomes the scientist who voices the urgency of energy transitions, while institutions remain paralysed. By foregrounding colonial legacies, racialised displacement, and generational urgency, the play demonstrates how energy imaginaries are shaped from positions of precarity rather than power. In this way, the immediacy of climate collapse is dramatised through the figure of a displaced girl who insists on becoming a scientist despite her marginal position. The dialogue makes clear that precarious circumstances can reshape agency, compelling even those excluded from mainstream institutions to assume responsibility for accelerating change:

**M:** Phoar. Why did you come? War?

**F:** Heat. Rivers dry up, crops fail, people need to move. Overcrowding, overpricing, a bit of overthrowing, then it's war, but it starts with the heat.

This blunt articulation of environmental violence shifts the focus from war as a political eruption to climate as the primary driver of displacement. The exchange foregrounds the collapse of distance: ecological disruption in one part of the world inevitably reverberates elsewhere. As the girl insists later:

**F:** At the moment it takes more energy to make the reaction than the reaction itself can generate. Like you wafting that paper, it was never going to work. That's what they're trying to solve. There's no urgency, no sense of life or death. They think they've got time on their hands because the death happens somewhere else, over there, the other side of the world. But the world's getting smaller. I washed up here for what? To sit and wait?

The insistence that 'death happens somewhere else' echoes the global inequities of climate change, which are often displaced onto peripheral geographies. Her refusal to wait positions her against the slow temporality of scientific progress, aligning instead with Timothy Morton's sense of climate change as a 'hyperobject' that cannot be contained by linear time or spatial separation (2013).

As the dialogue continues, this urgency collides with bureaucratic inertia:

**M:** You want to speed up science?

**F:** Yes.

**M:** Why you?

**F:** Why not me?

**M:** But if scientists can't—

**F:** Six years. It's a long time in limbo. I'm used to waiting, for lorries, Home

Office, science.

**M:** Lorries?

**F:** Calais.

The juxtaposition of ‘Home Office’ with ‘science’ places asylum systems and scientific institutions within the same logic of delay and containment. Climate precarity is thus bound up with the trauma of migration: waiting in camps, waiting for bureaucracy, waiting for scientific breakthroughs that never arrive. Una Chaudhuri’s argument that the Anthropocene compels us to ‘rethink the terms of belonging’ (2014, p. 25) is literalised here through the figure of the migrant scientist, who embodies both dispossession and agency.

Each fragment of dialogue enacts what Brian Larkin (2013, p. 329–335) call the ‘entextualisation’ of infrastructures: energy systems are not merely technical but are written into lives, bodies, and bureaucratic experiences. Placed in dialogue with Cotton Famine poetry, *Fusion* dramatises how voices from the margins, whether nineteenth-century mill workers confronting scarcity or twenty-first-century climate refugees confronting energy collapse, register the uneven entanglement of ecology, labour, and survival. Just as the poetry inadvertently documented thermodynamic ethics in practice, *Fusion* explicitly interrogates the moral and political stakes of energy futures. This continuity underscores Imre Szeman and Dominic Boyer’s argument that modernity cannot be disentangled from fossil fuels but must be grasped as fundamentally a ‘fossil-fueled modernity’ (Williams, 2019, p. 10).

Rather than offering speculative designs for new infrastructures, *Fusion* insists on the inevitability of crisis and the need to confront its inequitable distribution (Chakrabarty, 2009; Bonneuil & Fressoz, 2016; Ghosh, 2016). In doing so, it reframes agency not as a function of state policy or technoscientific mastery but as an emergent, embodied capacity forged through waiting, displacement, and survival.

*Things We hear When We're Not Listening* (Debbie McAndrew, 2020)

The third play, Debbie McAndrew's *Things We Hear When We're Not Listening* (2020), turns to wind energy and its affective entanglements. Centred on the relationship between Janet, a woman living next to a wind farm in Cumbria, and her daughter Claire, a marine biologist, the play explores how renewable energy infrastructures create new frictions within everyday life. Claire, a marine biologist, visits her mother Janet after the latter make a distressing call that leads Claire to believe she is seriously ill, which proves to not be the case. Janet lives in a small Cumbrian village next to a wind turbine farm. She recounts her experience to her daughter, living close to the wind turbines, as she is experiencing a constant noise that she claims to disrupt her life.

Janet: It doesn't have to be loud. You don't have to hear it at all for it to affect you. Claire:

I thought that was what noise pollution was.

Janet: Infrasound. [Pause] Infrasound. I googled it. Lots of people living near turbines experience the same symptoms. Sleep disturbance, headaches, irritability, memory problems.

Claire: All of which could be symptomatic of something else – including just getting older.

Janet: What about nausea, dizziness, tinnitus – a terrible feeling of dread all the time? I was fine until those things arrived.

Claire: And when did you start googling? Before, or after the turbines started up?

Janet: You should be worried about this, Claire. This house is all I've got to leave to you. It's not worth that much, but it has to be worth even less now. Who's going to buy it?

Claire: Are you selling up?

Janet: I've heard of people who just move out; abandon their homes; because they can't sell them and they can't stand living there any longer.

The play highlights new enmeshments that emerge from energy transitions, which depart from older regimes of power structured by thermodynamic laws of dissipation and conservation. Fossil fuel energy and even electricity have historically been kept out of sight, operating beyond the spatial and cultural boundaries of everyday life in urban centres. Renewable infrastructures such as wind turbines disrupt this invisibility. They intrude on the landscape, reconfigure familiar horizons, and generate intimate affective entanglements between humans, technologies, and non-human forces. Janet's catalogue of health issues—insomnia, nausea, tinnitus, and what she calls a 'terrible feeling of dread all the time'—register not only as physiological responses but also as psychosomatic manifestations of ecological anxiety. These embodied effects index how energy infrastructures, once hidden, now saturate the sensorium and reshape the very conditions of dwelling.

In the era of climate change, neoliberal energy transition policies frequently attempt to mobilise community affects, framing local populations as participants in sustainability, while in practice displacing costs and risks onto those same communities. Janet's fear of her house losing value, and her recognition that neighbours have abandoned their homes, foreground how energy infrastructures entangle with property markets, inheritance, and intergenerational security. What appears at the policy level as a neutral, technocratic transition becomes, at the intimate scale, a lived experience of crisis that accumulates slowly, diffuses across daily life, and magnifies over time into an overwhelming presence.

Here, the scalar disjuncture of the Anthropocene comes into focus. As Dipesh Chakrabarty (2009) has argued, climate change forces us to think at both human-historical and planetary scales, yet such abstraction often obscures the uneven distribution of vulnerabilities. Janet's distress makes visible how these planetary processes are lived in profoundly unequal ways. Kathryn Yusoff's (2018) critique of the Anthropocene reinforces this point: the category of the

‘Anthropos’ universalises responsibility while erasing the racialised, gendered, and classed asymmetries through which extractive and energy regimes have historically unfolded. In Janet’s testimony, we see not a universal subject of the Anthropocene but a specific, situated subject whose home, health, and future are destabilised by a supposedly ‘green’ infrastructure project.

The play thus mediates on material-human connections and the contradictions inherent in energy transitions. It demonstrates that infrastructures designed to mitigate planetary crisis can simultaneously generate new forms of localised precarity and dispossession. By centring embodied distress and community disruption, the narrative challenges the assumption that renewable transitions are inherently progressive. Instead, it exposes them as contested processes, entangled with historical legacies of extraction, capitalist development, and the uneven geographies of climate vulnerability.

What is particularly significant for this thesis is how Janet’s ‘feeling of dread’ can be read through the lens of thermodynamic ethics. In earlier chapters, I traced how Victorian debates around energy framed entropy as a moral disorder threatening social stability. Janet’s embodied anxiety resonates with this legacy: her dread is not only a personal symptom, but an experiential registration of disorder produced by shifting energy regimes. In thermodynamic terms, her body becomes a site where the entropic effects of infrastructural change accumulate, displacing stability with uncertainty. The transition from fossil fuels to renewables is thus not merely a technical recalibration but also an ethical and affective reconfiguration, demanding new ways of negotiating disorder, resilience, and care. In this sense, the play reactivates nineteenth-century anxieties around energy, efficiency, and entropy, while placing them firmly within the uneven, embodied realities of the Anthropocene.

In this sense, the play reactivates nineteenth-century anxieties around energy, efficiency, and entropy, while placing them firmly within the uneven, embodied realities of the Anthropocene.

Janet's 'feeling of dread' becomes emblematic of how transitions away from fossil fuels are lived as affective disruptions as much as technical adjustments.

If *Things We Hear When We're Not Listening* foregrounds the sensory and psychosomatic dimensions of renewable energy, Tajinder Hayer's *Tidelands* shifts the focus toward the entanglements of migration, climate catastrophe, and community rebuilding. Set against the backdrop of a tidal barrier in Morecambe, the play explores how infrastructural projects designed to mitigate "slow violence" (Nixon, 2011) simultaneously expose the uneven vulnerabilities of different communities. Here, the Anthropocene is not abstract or universal but experienced through the precarious meeting of a displaced Caribbean girl and a local woman, each grappling with personal loss and ecological upheaval.

*Tidelands* (Tajinder Hayer, 2020)

The third play, *Tidelands* (2020), shifts the focus from the nuclear-fusion imaginary to tidal energy, situating its story in Morecambe on the north-west coast. Here, two women—one younger, a climate refugee from Barbados, and one older, a local volunteer—meet in the aftermath of climate catastrophe. The younger woman has fled Barbados after the hurricane of 2024 destroyed her island; the older woman tends allotments near a newly constructed tidal barrier, built to mitigate severe flooding. Their relationship unfolds as a begrudging friendship,

grounded in grief, trauma, and an attempt to forge community across generational and cultural divides.

The setting of the tidal barrier is crucial. It symbolises an infrastructural response to ‘slow violence’ (Nixon, 2013) unfolding along the English coastline, while simultaneously invoking the deadly flooding that displaced the younger woman from Barbados. The juxtaposition reveals how infrastructures of protection in the Global North contrast sharply with the devastation in the Global South, foregrounding climate injustice.

Woman: We got offered plots when they made the tidal barrage back in '29. They said they wanted the community involved in the lagoon. A nice thought. I'm not used to cockles, mussels, those kinds of things. But seaweed, samphire I can understand. Restaurants round here lap it up. I go down there every fortnight or so. They let us have a wander on the beach with a creel before they let the tide back in. It's just an excuse for a nice walk for me.

The woman's reference to ‘back in 29’ resonates with audiences because it collapses temporal distance: the imagined future is so close to the present that it becomes uncanny, forcing listeners to reflect on the urgency of climate change and the immediacy of energy transitions. This uncanny nearness underscores how speculative dramaturgies refuse to cast ecological crises as distant or hypothetical; instead, they frame them as imminent and already underway.

Equally significant is the play's temporal layering. Its brevity and poignancy conceal a sophisticated manipulation of time: the immediate present of the audience's listening experience is folded into the near-future setting of the drama, while the characters' own dialogue remains haunted by memories of loss and displacement. This layering foregrounds the way

energy infrastructures—here the tidal barrage—are never just technical artefacts but palimpsests of past traumas, present negotiations, and imagined futures. As Nixon’s notion of “slow violence” (2011) suggests, such infrastructures carry temporalities that stretch across generations, materialising ecological harm not in spectacular catastrophe but in ongoing displacements and subtle ruptures of everyday life.

By weaving these multiple scales of temporality, *Tidelands* insists that the legacies of fossil-fuelled modernity persist within renewable projects that present themselves as solutions. The tidal barrier is depicted as both a response to climate crisis and a reminder of the deaths and dislocations that made it necessary in the first place. The play therefore exposes the paradox of energy transitions: while promising to secure the future, they are themselves haunted by histories of violence, inequality, and loss. This dramaturgical layering not only highlights the significance of time in thinking about energy systems but also reinforces how ecological crisis is experienced affectively—as grief, memory, and longing—rather than purely as technocratic problem-solving.

Girl: I do mean to stay away {GULLS CRYING}. I’ve got used to the early starts. I get up when the sun does three days in a row. I lie in bed listening to the gulls and the town waking up. The third day I cave in and I go down to the allotments. She’s not there. I wait an hour or so, do a bit of watering. I know what I’m putting off. So, I walk down the tidal barrier, walk in her daughter’s feet. I’ve got to come back, and it’s a good excuse to say hello. She’s there on the beach wading through the shallow water. Takes everything in me not to run then. The sand, the smell of it takes over. I know beyond that wall is the sea ready to pull me into it. Then she sees me.

The two women at the centre of the play assume a disproportionate share of emotional responsibility, revealing a distinctly gendered dimension of care in the Anthropocene. Positioned as both custodians of cultivated spaces and conduits for processing collective grief and climate anxieties, their efforts at tending the land and maintaining fragile communal bonds become enmeshed in the entropic dynamics of ecological crisis. In thermodynamic terms, their emotional expenditures act as a form of energy transfer, attempting to counterbalance the disorder produced by fossil-fuelled histories and climate disruptions. This scenario underscores that transitions away from entrenched energy systems demand not only technical and infrastructural change, but also affective resilience and ethical recalibration; an intersectional reimagining of sustainability, community, and the moral economies of care. The question of agency in relation to climate crisis is further illuminated when placed alongside Alistair McDowall's *Pomona* (2014). While not part of my primary case studies, *Pomona* offers a useful counterpoint in how it stages catastrophe as already normalised under late capitalism. The play takes place in a deserted island in the centre of Manchester, where a woman goes missing. Her twin sister is enlisted to help her find her, and the audience watches her descent into a confusing world, where underground hospitals exist, and where the disappeared are kept for the purpose of harvesting their organs. The play is set like the ones I am examining here in the near future, and shares features of speculative fiction as well as playing around with the familiar trope of nuclear catastrophe and fallout, although in this case the repercussions are of a much smaller scale, as the damage is only material, and no casualties are implied in the play.

As Reid argues, the play highlights how trauma becomes diffused and normalised, making the characters' detachment feel like a natural response to systems where ecological and social breakdowns are ongoing crises (Reid, 2017, p. 79). This perspective sharpens the reading of *Tidelands*: the women's acts of care, and their fragile emotional economies can be understood

not only as responses to immediate loss but also as resistances to the broader cultural tendency to absorb crisis into the background of daily life.

*Pomona* stages a dystopia that feels like an intensification of our own world rather than a rupture from it. Its imagined catastrophes expose how little room late-capitalist infrastructures leave for meaningful agency. By contrast, *Tidelands* shows how agency persists in quieter, relational forms: tending, grieving, and sustaining connections in the shadow of ecological collapse. This juxtaposition demonstrates that imagining energy transitions requires more than technical fixes; it also requires an honest reckoning with the affective, gendered, and often precarious labour that sustains communities in conditions of permanent crisis. As Reid argues:

*Pomona* stages a dystopia that is particular to late capitalism; in it, catastrophe seems to have been normalised, and far from acting as a pretext for the emergence of a different way of living, the imagined world feels like an extension or an intensification of our own. It is very hard to see a way out. Without the capacity to mal the social and political world they inhabit McDowall's characters have no means by which to gain agency in relation to those systems (2017, p.79).

Reid's analysis of *Pomona* is especially pertinent to this thesis because it highlights how dystopia under late capitalism manifests not as rupture but as continuity. The normalisation of catastrophe, where systemic collapse feels like 'an extension or an intensification of our own' (Reid, 2017, p.79), echoes the entropic logic of thermodynamic ethics. In the nineteenth century, the fear of entropy crystallised around the possibility that energy systems might dissipate irreversibly, destabilising industrial progress. In *Pomona*, this entropic pull is reconfigured through late-capitalist infrastructures, where social and ecological collapse no longer appear as future threats but as conditions already embedded within the present.

This framing matters because it underscores how fossil-fuelled modernity is able to metabolise disorder into business-as-usual, foreclosing the emergence of alternative energy imaginaries. The characters' lack of agency is not simply a narrative device but a dramatisation of how infrastructures (economic, political, and energetic) discipline subjects into resignation. Unlike the speculative hope of a paradigm shift, here entropy is naturalised, leaving no apparent way out.

Placed alongside the *Keeping the Lights On* plays, however, *Pomona*'s bleak intensification becomes a useful counterpoint. Whereas McDowall's world exemplifies how crisis can be absorbed by capitalist infrastructures, plays like *Fusion* and *Tidelands* propose fragile but vital alternatives: intergenerational care, diasporic ethics, and community-based resilience. Together, these works show that the entropic imaginary can either normalise catastrophe or galvanise new forms of agency, depending on how it is staged.

All the plays in *Keeping the Lights On* (2020) trace dystopian iterations, yet there is also a firm grounding in realism, and I argue that this is deliberate. As Trish Reid observes, the 'strange temporality inherent in the dramaturgy of unwelcome futures and the schism that separates the audience from those futures become the means by which we understand the horrors of the present' (2017, p. 75). This point resonates with the plays here, which similarly resist linear realism to highlight how climate disruption unsettles temporal and social norms. Yet while Reid situates this trend within contemporary British drama more broadly, these Lancashire-based works insist on embedding dystopian futures within the textures of everyday life, exposing how energy scarcity, climate precarity, and austerity are already lived realities rather than speculative abstractions.

Such a refusal of strict realism creates space for narratives that confront urgent climate anxieties and the perceived inertia of established scientific institutions. In this dramatic context,

environmental crises, rooted in collapsing ecosystems, forced migrations, and deferred technological advances, become personal struggles demanding immediate, embodied responses. This aligns with Rob Nixon's (2011) notion of 'slow violence,' where environmental harms are experienced incrementally and intimately, and Una Chaudhuri's (2014) insistence that theatre can resituate audiences within planetary scales of the Anthropocene. By staging these tensions, the plays create ecosystems within both their dramaturgy and performance that mirror the entropic instabilities of climate collapse, inviting audiences to grapple with anxieties that are at once intimate and structural, immediate and ongoing. As Trish Reid notes, dystopian dramaturgies often rely on unfamiliar temporalities to expose 'the horrors of the present' (2017, p. 75). *Keeping the Lights On* adopts this strategy but grounds it in local, everyday contexts, where energy precarity and climate anxieties are already lived realities rather than distant futures.

## Conclusion

In this chapter, I have focused on English dramaturgies emerging from beyond central London's theatrical circuits that engage with near-future scenarios tied to energy futures, climate change, and environmental justice. These works echo the anxieties embedded in 19<sup>th</sup> century thermodynamic ethics, where debates over energy efficiency, entropy, and moral responsibility first shaped understandings of industrial progress and resource management. Much like their Victorian predecessors, these contemporary plays reimagine the complex moral quandaries surrounding the extraction and use of fossil fuels, while also confronting the legacies of colonialism, class division, and systemic inequality that have long been entangled with energy infrastructures.

By adopting post-apocalyptic and speculative tropes, these plays challenge conventional realism and instead highlight the fraught conditions under which energy transitions occur. Their narratives insist that current ecological instabilities, driven by centuries of fossil energy dependent acceleration, cannot be remedied merely through technological solutions or incremental policy shifts. Instead, they necessitate a re-examination of the historical and ethical frameworks that once guided thermodynamic thought in the 19th century. These re-imaginings push audiences to see that the moral questions raised by industrial-era energy debates persist today in more complex forms, complicated by climate change, postcolonial critiques, and feminist ethics of care.

As Dominic Davies observes, ‘the future of life on Earth depends on urgently resisting infrastructures and relations of accumulation by... limiting the extraction and consumption of fossil fuels’ (2019, p. 2). In other words, acknowledging infrastructure as a historically embedded and ethically charged process resonates with the 19th-century impulse to align energy efficiency with moral order, now recast in a far more precarious age. By foregrounding collective struggles in peripheries and marginal communities, these plays thereby integrate thermodynamic ethics with contemporary socio-ecological dilemmas, underscoring the idea that meaningful responses to climate crisis and energy transitions demand not just scientific adjustments, but also profound moral and historical reckonings.

By engaging with post-apocalyptic and speculative genres, the plays examined here move beyond simply speculating on what future energy infrastructures should look like. Instead, they actively rework dominant narratives to illuminate the material and emotional complexities of energy and climate crises. Rather than confining themselves to conventional representations, these works highlight the experiential realities of communities disproportionately affected by climate instability, communities shaped by immigrant experiences, marginalisation, and post-colonial legacies. In doing so, they challenge any static continuity with earlier texts like the

Cotton Famine poetry, instead reinterpreting historical energy attachments for the present and future.

Their dramaturgies do not merely dramatise structural problems; they also foster more expansive imaginings of energy transitions and climate resilience. These plays validate that the energy humanities are not an exhaustive archive, but a starting point that encourages ongoing inquiry and iterative critical engagement. Deprived of major platforms and ample resources, their creators still forge accessible, resonant performances that draw audiences (often from outside mainstream discourse) into dialogue about energy and climate. As Anna Pigott suggests, ‘this space of slowing, resisting, of acknowledging the unknown [...] helps one to gain a glimpse at how particular futures and temporalities, which have emerged as seemingly universal, might not be so universal after all’ (2018, p. 128). In line with this perspective, the plays discussed here offer precisely that recalibrating space. They position environmental crises not as distant, universal narratives resolved by top-down expertise, but as complex, lived realities calling for localised, ethically responsive forms of understanding and action.

What becomes apparent in these narratives, especially those crafted as performative experiences, is that re-examining our ‘energy unconscious’ (Yaeger, 2011) reveals a complex cultural substrate underlying present and future energy dilemmas. Rather than delivering prescriptive futures or fixed infrastructural templates, the plays analysed in this chapter foreground emotional, historical, and political intricacies that shape how communities comprehend and navigate energy transitions. They challenge the dominant rhetoric of sustainability as a straightforward pivot away from fossil fuels, instead spotlighting deeply entrenched colonial legacies, class divides, and migratory struggles embedded in what we have come to know as the Anthropocene (Yusoff, 2018; DeLoughrey, 2019).

This approach echoes Haraway’s (2016) notion of ‘staying with the trouble’ and Tsing’s (2015) focus on precarious life, insisting that solutions to climate and energy problems are not

merely technical or managerial but instead demand cultural re-imaginings and ethical recalibrations. By pushing beyond London's established theatrical circuits and resisting static, realistic portrayals, these productions invite audiences into a space where environmental devastation, slow violence (Nixon, 2011), and unresolved historical attachments to fossil fuels converge. They do not just illustrate the aftermath of fossil capitalism; they also prompt reflection on how these entanglements were historically formed and continue to shape uneven socioecological futures. In this sense, they pick up threads from the previous chapter's consideration of the Cotton Famine poetry, where early labouring voices inadvertently recorded the infiltration of carbon intensive modernity into their daily lives. Now, instead of unconsciously mirroring industrial ethics, dramatists explicitly confront and reinterpret these legacies for the present day.

These theatrical narratives demonstrate that energy humanities are neither a static field nor a domain exclusive to central cultural stages. Instead, it emerges as a dynamic, evolving field that benefits from the insights and strategies of artists situated in more peripheral regions and precarious contexts. Their dramaturgies, performative devices, and ethical commitments expand our repertoire of critical tools, encouraging us to consider energy not as an abstract global challenge but as a site of lived tensions, cultural negotiations, and moral reckonings.

In the following chapter, interviews with the creators of these plays will further solidify these connections. Hearing directly from playwrights and practitioners will articulate how their artistic decisions, aesthetic innovations, and ethical commitments align with (or deviate from) the arguments advanced thus far. This dialogue with the authors themselves will strengthen the thesis's central claim: that cultural interventions, spanning from the historical poetics of fossil capitalism to contemporary post-apocalyptic stagings, hold the potential to unsettle entrenched assumptions, open conceptual space for genuinely transformative energy imaginaries, and shape the debate about energy futures and climate justice.

### *Chapter Three: Theatre Through an Ethnographic Lens: Regional Playwrights and Energy*

#### From Narratives to Practice: a Transdisciplinary Orientation

This chapter develops the analysis by moving from dramaturgical readings to practitioner perspectives and audience experience. Plot and production overviews of *North Country*, *Fusion*, *Tidelands*, *Things We Hear When We're Not Listening*, and *Ergon: The Wicked Problem* are provided in Chapter 2 (§2.1). Here I do not rehearse those summaries; instead, I analyse interviews and auto/ethnographic materials to show how theatre-makers and audiences co-produce energy imaginaries in situated contexts. Method note. Chapter 2 examines performances and scripts as staged artefacts; Chapter 3 examines creative process (interviews, R&D) and reception (my audience fieldnotes). I flag when a claim rests on intention (practitioner testimony) versus performance evidence. Here too, (as in chapter 2), I privilege dramaturgical analysis of performance over textual or authorial readings, attending to how participatory structures, spatial design, and audience engagement generate meaning in practice. This aligns with performance studies approaches that foreground theatre's embodied and relational dimensions (Fischer-Lichte, 2008; Bishop, 2012), highlighting performance as a site of knowledge-making and collective reflection rather than simply textual representation. Conceptually I keep the frame light: sociotechnical imaginaries to track future-making, performance as repertoire to register embodied transmission, and a minimal new-materialist hinge to attend to sensory/infrastructural entanglements. The aim is not to rebuild the theoretical architecture of Chapter 2, but to show how practitioners operationalise it in rehearsal rooms, commissions, and audience encounters. Where relevant, I mark how interviewees implicitly

redeploy the moral vocabulary of conservation and waste described in Chapter 2, without re-expounding it here.

This chapter advances the previous one by shifting from dramaturgical analysis of performed works to an ethnographic account of how those works are made, received, and situated. Drawing on semi-structured interviews with playwrights and on autoethnographic notes from performances, I examine regional theatre in Lancashire and Cumbria as a practice of knowledge-making about energy transitions. The emphasis here is on process and participation; how commissions, rehearsal heuristics, and post-show deliberations shape the content and uptake of energy narratives, rather than on restating textual or staging features already analysed in Chapter 2. The interplay of text and context in these works highlights the relevance of locality in cultural production. Ethnographic accounts offer a more complex understanding of how energy narratives emerge from specific geographical settings, particularly those shaped by historical imperialism, industrialisation, and their ecological repercussions. In line with Appadurai's (1996) conceptualisation of imagination as a social practice, these playwrights reimagine energy futures through a regional lens that foregrounds community-oriented storytelling. This regionality, I argue, serves both as a constraint and a creative catalyst, enabling productions to attend to marginalised voices and historical entanglements that mainstream energy discourses often exclude.

Theatre is always shaped by its material environments, yet it also contributes to imaginative reconfigurations of energy and ecological relations. Marinetti and Rose (2013) observe, theatre's capacity to mediate between performers, audiences, and material settings creates space for reflective dialogue and community engagement. The plays examined here do not simply represent energy futures; they intervene in the lived crises of energy precarity, rural marginalisation, and climate inequality.

Ethnographic methodologies deepen this analysis by situating theatre within its social contexts. This methodological transition reflects a transdisciplinary orientation. As Pohl and Hirsch Hadorn (2007) and Lang et al. (2012) argue, transdisciplinarity extends beyond interdisciplinarity by actively integrating practitioner and community knowledge into the research process, addressing real-world problems in their full complexity. Rather than analysing theatre solely as text or performance, this chapter situates dramaturgical readings within a broader ecology of practice, one that incorporates playwrights' testimonies, rehearsal heuristics, and audience responses. In doing so, it produces a more situated and relational account of how energy imaginaries are co-produced.

Such an approach resonates with MacLeod and Nagatsu's (2018) call for 'problem-oriented' inquiry, which emphasises responsiveness to societal challenges rather than disciplinary boundaries. Energy transition is not only a matter of cultural representation but also a lived dilemma, one negotiated in rehearsal rooms, local commissions, and post-performance deliberations. By tracing these negotiations, I demonstrate how theatre operates as a transdisciplinary practice: it does not merely mirror sociotechnical change but actively contributes to it by fostering spaces of reflexivity, critique, and imagination.

This perspective aligns with broader currents in performance and environmental humanities. As Nicolescu (2014) suggests, transdisciplinarity requires attention to the 'in-between' zones where different forms of knowledge and practice intersect. Theatre exemplifies this condition by inhabiting the thresholds between artistic creation, community engagement, and ethical deliberation. In the context of energy and climate crisis, these intersections become particularly salient: aesthetic choices, such as how to stage a power plant, or whether to invite the audience into decision-making, are inseparable from ethical considerations about sustainability, justice, and collective responsibility.

By foregrounding these entanglements, this chapter positions regional theatre as more than a cultural artefact: it becomes a laboratory for experimenting with new forms of sociotechnical imagination. The move from narrative analysis to practitioner ethnography thus underscores the project's transdisciplinary commitment—acknowledging that energy futures are shaped not only by experts or policymakers, but also by the imaginative, affective, and participatory practices of artists and communities. By tracing these negotiations, I demonstrate how theatre operates as a transdisciplinary practice: it does not merely mirror sociotechnical change but actively contributes to it by fostering spaces of reflexivity, critique, and imagination.

As Enria (2015) notes, ethnography uncovers 'contextualised insights' that textual readings alone cannot provide. This is especially evident in participatory forms such as *Ergon: The Wicked Problem*, where audiences are invited to act as jurors, taking on responsibility for climate and energy decisions. This participatory mode foregrounds collective accountability and care, transforming spectatorship into deliberation. It demonstrates how theatre can embody what Mikulak (2008) calls 'kinship imaginaries': networks of relation that counteract the atomising tendencies of neoliberalism and fossil-fuelled capitalism.

[W]hile it may seem trite to focus on questions of narrative, representation, agency and subjectivity in the face of more 'pressing' material concerns, the environmental crisis is more than a problem for scientists; it is a problem of narrative, ontology and epistemology. It is as much a failure of imagination as it is a technological problem, arising from maladapted social and political ecologies that fail to establish healthy and sustainable networks of kinship imaginaries. (Mikulak, 2008, p. 66)

This attention to imagination and kinship underscores how regional productions mobilise performance as a method of 'performative knowledge-making' (Taylor, 2003). Juárez-Bourke's

(2018) study of the Freiburg Scientific Theatre demonstrates how participatory performance can ‘integrate knowledge and values, communicate complexity, foster reflexivity and deliberation, build socio-ecological identities, and foster emotional commitment to action’ (p. 74). *Ergon* operates in a similar register: it does not merely dramatise climate crisis but actively rehearses democratic deliberation, placing audiences inside the ethical and political dilemmas of energy transition.

Building on these insights, my autoethnographic reflections situate my spectatorial experience within a wider ethnographic framework, tracing how theatre’s materiality, affective intensity, and collective atmosphere generate new ways of sensing energy transition. Methodologically, I combine interviews with playwrights and firsthand audience engagement to examine how regional theatre functions both as dramaturgy (performance practices and staging) and as cultural discourse (narrative strategies and social imaginaries). This dual focus addresses my examiners’ call to distinguish clearly between script, performance, and critical reception.

Regional productions thus provide an alternative epistemology of energy transition; one grounded in place-based knowledge and affective engagement rather than abstract policy frameworks. Unlike national-level climate discourses, which often privilege technocratic solutions, these plays foreground human relationships, ethical dilemmas, and embodied participation. They show how theatre can function as a site of resistance, critique, and collective imagination, preparing the ground for my close analysis of *Ergon: The Wicked Problem*.

My experience as an audience member of *Ergon: The Wicked Problem* (9 November 2021) underscores the power of participatory storytelling in engaging publics with the complexities of energy and climate ethics. The courtroom structure invited the audience to deliberate on the fate of its protagonist, Alex Hummel, fostering a collective sense of responsibility that mirrored broader societal dilemmas around justice, accountability, and energy transition. The tension in the room was palpable: were we to condemn Hummel for his reliance on coal, or recognise the systemic constraints that shaped his choices? This was not just dramaturgical tension; it was a lived enactment of the ethical contradictions underpinning real-world energy politics.

Autoethnography offers a means to capture the deeply embodied and affective quality of this experience, attending to how audiences process climate crisis through performance (Ellis et al., 2011). The immersive design blurred the line between spectator and participant, compelling me to not only think through the dilemmas but to feel them viscerally. As Bourke (2018) argues, conventional methodologies struggle to register the affective force of environmental discourse, demanding frameworks that account for the interplay of narrative, materiality, and emotion. In this sense, theatre does not simply represent crisis; it stages it, forcing audiences into the entanglements of energy transition as implicated agents rather than passive observers.

That night, the effect was immediate. As soon as the final arguments concluded, the audience erupted into debate. Small clusters formed across the room, voices overlapped, hands gestured emphatically, bodies leaned in toward one another in animated discussion. No one waited for permission; the courtroom had collapsed into something closer to a town hall. ‘He had no other choice,’ someone insisted, ‘he did what he had to do.’ Another retorted, ‘If we excuse this, we excuse everything.’ A third voice cut through: ‘The trial itself is flawed; it scapegoats an individual while the system remains invisible.’ The play had generated a microcosm of climate justice debates: urgent, fractured, unresolved.

That night, the jury found Alex Hummel guilty. Yet as we cast our votes, discomfort rippled across the room. In my notes I wrote: ‘The decision is made, but no one looks triumphant. The room is still charged with dissent. Some shake their heads. Others keep debating long after the end. This verdict will not settle; it will linger.’ Each performance thus becomes an arena for energy ethics, its outcome shifting with every new jury. Theatrical judgment here functions as collective sense-making, staging the irresolution that defines climate politics: who is accountable, who bears the cost, and what futures are foreclosed by our choices.

The dramaturgical structure of *Ergon* resonates with other participatory theatre practices that place audiences at the centre of ethical deliberation. Fast Familiar’s recent work, including *The Strategy Room* (2023), which invites participants to act as citizens debating pathways to net zero, similarly transforms spectators into decision-makers, where audiences practice the collective negotiation of policy dilemmas. Fast Familiar’s model demonstrates how participatory dramaturgy can directly engage publics with climate governance, making abstract policy debates tangible through embodied decision-making. Read alongside *Ergon*, these practices illustrate a growing repertoire of performance strategies that intervene in environmental discourse by staging deliberation itself as theatre. Such performances function less as didactic exercises and more as rehearsals for democracy, inviting audiences to practise collective negotiation of policy dilemmas in a safe, experimental environment. The model developed by Fast Familiar demonstrates how participatory theatre can stage complex social choices, foregrounding the tensions of decision-making while also enabling audiences to test alternative futures. In this sense, performance becomes a civic laboratory: not merely reflecting political challenges but actively enacting them through embodied, shared experience.

This comparative frame highlights how theatre reconfigures what Michael Mikulak (2008) terms ‘kinship imaginaries’: the narratives and practices that bind humans, nonhumans, and

infrastructures together. In participatory performance, these imaginaries are not abstract ideals but lived experiments in collective responsibility. As I deliberated with fellow audience members, I became acutely aware of how energy justice is always mediated through social relationships, ethical negotiation, and material constraints. The participatory dramaturgy mirrored the structural reality of climate negotiations: contested, uneven, but inescapably collective.

In methodological terms, my autoethnographic engagement underscores the significance of performance analysis, not just scripts or playwrights' intentions, in understanding how energy imaginaries are enacted. The affective heat of the debate, the embodied discomfort of unresolved decisions, the material arrangement of the courtroom space: these dramaturgical elements constitute the analytic core. They demonstrate how theatre, particularly in regional contexts marginalised by national policy, intervenes in cultural and political debates by making publics feel their complicity and agency.

What emerges is a recognition that energy transitions are never purely technical but deeply social and ethical processes. Theatre renders this visible by implicating its audiences in collective responsibility. As Jasanoff and Kim (2009) argue, sociotechnical imaginaries are cultural as well as technological constructs; in the case of *Ergon* and *Fast Familiar*, those imaginaries are staged as trials, deliberations, and debates that leave no audience member untouched.

In this way, participatory theatre acts as a crucial site for interrogating the moral economies of energy. It does not deliver resolutions but unsettles, leaving audiences to wrestle with the same contradictions that animate climate politics. This is precisely its power: by staging irresolution as an embodied, collective experience, theatre refuses the closure of technocratic solutions,

foregrounding instead the messy, affective, and contested processes through which energy justice must be imagined.

### Ethnographic Contexts: Playwrights, Regional Theatre, and Energy Imaginaries

Alongside my autoethnographic reflections, I situate my research within an ethnographic analysis of how regional theatre companies create and perform energy imaginaries. Where autoethnography captured the affective intensity of performance as an audience member, ethnography allows me to explore the processes, motivations, and contextual frameworks that inform theatrical production. This distinction highlights the interplay between dramaturgical experience and the cultural labour of theatre-making, addressing the need to separate performance analysis from broader contextual accounts.

My fieldwork concentrated on two theatre companies working in Northern England: Ragged Edge Productions in Cumbria and Ergon Theatre in Manchester. Ragged Edge exemplifies how rural and peripheral contexts (Williams, 1973; Massey, 2005) become sites of cultural production. Through interviews, rehearsal visits, and informal conversations, I observed how the company draws on local infrastructures—wind, tidal, nuclear—to explore community entanglements with energy systems. While not exclusively dedicated to environmental themes, their work situates energy within the lived realities of deindustrialisation, rural precarity, and ecological anxiety. This re-centres the so-called ‘periphery’ as a dynamic space where global climate debates are refracted through everyday experience.

Ergon Theatre, by contrast, operates in an urban and explicitly climate-focused register. Commissioned by Contact Theatre to stage Manchester’s climate futures, their performances combine scientific data with participatory storytelling, asking audiences to deliberate on energy justice, accountability, and systemic inequality. My ethnographic fieldnotes recorded how these productions mobilised both urban space and collective conversation, transforming theatre into

a venue for social negotiation. Interviews with company members further underscored their aim of collapsing the distance between audiences and climate discourse, embedding scientific fact within local narratives of responsibility and care.

Taken together, *Ragged Edge* and *Ergon* illustrate the ethnographic significance of regional theatre in shaping how communities debate energy futures. Their practices resonate with Appadurai's (1996) notion of imagination as a 'ground for action,' but refracted through place-based storytelling. Playwrights and theatre-makers do not simply stage abstract energy dilemmas; they embed them within histories of industrial decline, regional identity, and contemporary anxieties over transition. This supports the argument that energy imaginaries are not abstract constructs but emerge from situated, collective practices (Gupta & Ferguson, 1992).

Fast Familiar's participatory productions, such as *The Strategy Room* (2023), as mentioned above, provide a useful comparative frame here. Like *Ergon: The Wicked Problem*, their courtroom and jury-based formats position audiences as active decision-makers, collapsing the distinction between spectatorship and deliberation. As Barnard and colleagues note in their Process Blog, these formats foreground not only ethical responsibility but also the imaginative work required to envision just climate futures. Incorporating Fast Familiar into this analysis highlights how participatory dramaturgies circulate transnationally, with regional companies adapting them to the specific political and ecological contexts of Britain's Energy Coast.

My ethnographic interviews with playwrights further clarify how creative practitioners understand their role in these processes. Many articulated their work as a response to the contradictions of living with unsustainable energy systems: fuel poverty, contested infrastructure projects, and uneven exposure to environmental risks. (Atsalis et al. 2016) These interviews confirm that performance is not only an artistic practice but also a mode of community research; gathering narratives, staging dilemmas, and inviting audiences to

deliberate. As one playwright put it, ‘our job is not to give people answers but to give them a space to wrestle with questions that are already shaping their lives.’

By distinguishing this ethnographic perspective from the autoethnographic lens of performance experience, I demonstrate how theatre operates both as an affective space of encounter and as a process of knowledge production. Regional theatre thus emerges as a vital ethnographic lens: a way of tracing how energy imaginaries are created, contested, and transformed through collective practice. This section lays the groundwork for my concluding reflections in Chapter Two, which call for a more robust postcolonial and accountability-focused analysis of energy transitions.

### Dystopia, Utopia, and the Margins: Exploring North Country and Sociotechnical Imaginaries

(For a dramaturgical synopsis, see Ch.2 (§2.2). Here I analyse Hayer’s interview to foreground marginalised futurities and infrastructural decay as writing constraints and creative catalysts). This section begins with an analysis of my interview with Tajinder Hayer, author of *North Country* and contributor to the *Keeping the Lights On* radio play series by the Cumbrian production company Ragged Edge. Tajinder, who also teaches Creative Writing at Lancaster University, developed *North Country* as part of his PhD in 2012, though the concept had been with him since 2006. We met online in March 2021, during lockdown, and the conversation naturally touched on the eerie relevance of his play’s subject matter; a deadly virus wiping out most of the world’s population. Set in 2016, *North Country*’s post-apocalyptic premise feels uncomfortably close to home, collapsing the distance between speculative fiction and lived experience.

Tajinder identified the 2008 financial crisis as a key inspiration, describing the play as ‘a piece about communities trying to survive in a time of scarcity’. Themes of scarcity and excess, recurring throughout the narratives I explore in this thesis, resonate not only in the play’s depiction of a resource-depleted future but also in its geographical and infrastructural setting. Bradford, Tajinder’s hometown<sup>3</sup> and the play’s location, shaped his imagination as a landscape already bearing post-apocalyptic scars from industrial decline. He described the city as ‘a place that never quite recovered from the industrial decline of the 1970s and 1980s. The abandoned husks of factories punctuated the landscape of my childhood and adulthood, these locations were already post-apocalyptic in a way’. He also brings in the temporal dimensions of the play’s genre, Science Fiction, and argues that certain voices have been excluded traditionally from working in this mode. He also touches on the impact that talking about these peripheral voices has on the construction of futures.

I was also aware that I was bringing together disparate elements that haven’t usually overlapped: the post-apocalyptic genre, British Asian stories, theatre. [...]

However, there’s also a process of change going on in SF, fantasy and horror – a real awareness of diversity in fields that have had a problematic relationship in the past. Why is this so important to me beyond the obvious reason? Let me look at the genre of science fiction – this is an area that often looks at possible futures. If British Asian writing is excluded or self-excludes from the genre, then you’re excluding yourself from a vision of a future.

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<sup>3</sup> The play maybe set in Bradford, yet Tajinder's residence in Lancaster brings a perspective that resonates with many of the themes found across the North West of England. This geographical connection enriches the play's relevance, which is why it has been included in the analysis of works from the region.

Tajinder Hayer's reflections on *North Country* provide a valuable entry point for examining how marginalised voices challenge the established conventions of post-apocalyptic narratives. By centring British Asian experiences, Hayer critiques the historical exclusion of non-Western perspectives from speculative genres, particularly science fiction. As Rieder (2008) argues in *Colonialism and the Emergence of Science Fiction*, the genre has often served as an ideological apparatus of imperialism, reinforcing Eurocentric visions of technological mastery and progress. Hayer's assertion that excluding British Asian writing from science fiction 'excludes [them] from a vision of a future' foregrounds the politics of representation and the necessity of diversifying futurity. *North Country* follows the lives of a group of British Asians after a deadly pandemic kills the world's majority, and the action takes place in three temporalities, from 2016 when it starts until 2058, with the characters trying to survive fuel and resource scarcities. The geographical specificity of *North Country* is also critical to its sociotechnical imaginary. By setting the play in Bradford, a city scarred by the decline of industrial manufacturing, Hayer situates the narrative within a space already marked by infrastructural decay and socio-economic precarity. This resonates with Nixon's concept of 'slow violence' (2011), where the long-term degradation of environments disproportionately affects marginalised communities.

Hayer's speculative engagement with abandoned infrastructures, power stations, oil wells, and nuclear reactors, raises pertinent questions about human intervention and environmental stewardship. Hayer's post-apocalyptic vision, therefore, aligns with contemporary ecological critiques that emphasise the entanglement of human and non-human actors in shaping environmental futures (Barad, 2007). We talked about the binary of dystopia/utopia in our interview, and Tajinder addressed the issue of what happens to infrastructures when humans are not there.

[...] I did, like part of me was wondering, you know the side of me that kind of did the research thought, okay so if 1% of the world's population still exists,

what's happening to all those power stations, those nuclear power stations? What's happening to those oil wells? You know, there would potentially be multiple environmental catastrophes happening all around the North Country universe because there would not be the people to literally kind of cap off an oil well [...] so there would be no end to carbon emissions potentially. Or, you know if there was a nuclear reactor that went into meltdown.

The generic framings of dystopia and utopia emerge as significant themes in our conversation, particularly in the vision of a future where environmental changes have caused profound mutations in the human population. In the third part of the play, Tajinder imagines a world where non-human elements are deeply entangled with humans, leading to a form of human mutation that aligns with the concept of the *cyborg*. This notion of the cyborg, a hybrid of human and machine or other non-human entities, is a powerful framework for understanding such a vision, as it challenges traditional boundaries between nature and culture, human and non-human.

Donna Haraway's seminal essay *A Cyborg Manifesto* (1991) provides a relevant theoretical lens for this exploration. Haraway positions the cyborg as a figure that disrupts essentialist binaries, offering a metaphor for the interconnectedness of humans, technology, and ecological systems. In Tajinder's envisioned future, the fusion of human and non-human elements suggests a posthuman reconfiguration of identity and agency, reflecting the profound material and ecological entanglements of the Anthropocene.

When prompted to elaborate on this imagined future, Tajinder described it as 'kind of quite Edenic-like', evoking a utopian quality despite the implied mutations and hybridity. This blending of dystopian elements (mutation, environmental crisis) with utopian aspirations (a harmonious, Edenic existence) reflects the ambivalence that often accompanies visions of the cyborg. While the cyborg represents a break from human exceptionalism, it also holds the

potential for reimagining coexistence with non-human others, as scholars like Rosi Braidotti (*The Posthuman*, 2013) argue. Tajinder's portrayal of this future resonates with the notion of 'biomimetic utopias', where the boundaries between human and non-human life dissolve, and new forms of ecological harmony emerge (Graham, 2002). Such narratives illustrate how speculative storytelling can serve as a site for negotiating anxieties and hopes about ecological futures and the evolving role of humanity within them.

And I think if we look at our future, if we're looking at our environmental future, there is this kind of negotiating with the dread of climate change [...]. But the thing about apocalypses is that they sort of, you know you've got a-, by the very fact of what they are, they represent this kind of paradigm shift where you have the preapocalyptic world, the post-apocalyptic, and often historical change doesn't necessarily work like that, you know. There are more gradual processes that take place, whereas with this kind of seismic event, it often allows you to kind of use that reframing as a way of shining a light on the old country that was left behind. So the world that we live in now, and what gets carried on, what gets left behind, what gets reshaped.

Furthermore, Hayer's exploration of dystopia and utopia in *North Country* reveals a nuanced critique of apocalyptic thinking. While he acknowledges the seismic shift represented by apocalyptic scenarios, he also critiques the tendency to frame historical change as abrupt and binary. This approach also echoes Andrew Tate's (2017) examination of apocalyptic fiction in *Apocalyptic Fiction*, where he highlights how such narratives grapple with the tension between abrupt endings and the persistence of human experience. Tate underscores the dual function of apocalyptic storytelling: it serves as a warning about impending disaster while also allowing space to imagine continuity and survival beyond the collapse. By weaving together themes of

scarcity, excess, and mutation, *North Country* resists the simplistic binaries that often define apocalyptic narratives. Instead, it offers a layered exploration of both continuity and rupture, challenging audiences to reconsider the temporal and ethical dimensions of environmental and social crises.

The critique of infrastructure in *North Country* underscores the persistent tension between technological progress and environmental sustainability. Hayer's references to uncapped oil wells and potential nuclear meltdowns recall the nineteenth-century legacy of thermodynamic ethics, which privileged extraction and accumulation over ecological balance (Daggett, 2019). By foregrounding these anxieties, the play highlights the urgency of reimagining energy systems not as instruments of domination but as sites of interdependence and care, aligning with feminist critiques of extractivist logics (Puig de la Bellacasa, 2017). In situating Bradford within a global landscape of ecological collapse, Hayer demonstrates how local vulnerabilities mirror planetary crises, exposing both the centrality of energy dependency to modern life and the unequal distribution of its costs. The narrative thus critiques not only the fragility of energy infrastructures but also the structural injustices that ensure marginalised communities disproportionately endure their consequences. In this framework, energy is not just a physical resource, but a force embedded in global inequalities. The uneven access to energy, as well as the disproportionate impact of its extraction and consumption, reveals an ethical imbalance in the way energy regimes operate. Hayer's depiction of Bradford as a site of post-apocalyptic collapse highlights this disparity, serving as a metaphor for how the localised consequences of energy dependency reflect systemic global injustices.

Thermodynamic ethics also interrogates the sustainability of energy practices and their entanglement with colonial histories and capitalist expansion. In *North Country*, the collapse depicted in Bradford can be read as a critique of an energy-intensive, growth-driven system that prioritises short-term gain over long-term planetary and social stability. By situating this

local collapse within a global framework, Hayer invites readers to consider how energy regimes perpetuate both environmental degradation and social inequities, urging a rethinking of energy use through an ethical lens that accounts for interdependence and justice. This linkage between the local and the global, through both thermodynamic ethics and Hayer's narrative strategy, challenges readers to confront the moral implications of energy consumption and the need for equitable energy transitions. The dystopian landscape of Bradford serves as both a warning and a call to action, emphasising the urgency of addressing the ethical dimensions of energy dependency on a planetary scale.

This aligns with Sheller's (2018) argument that energy transitions must account for global inequities, recognising the disproportionate burden borne by historically marginalised communities. Hayer's vision of a 'kind of paradigm shift,' where 'what gets left behind' is as significant as 'what gets carried on,' extends the genealogy of sociotechnical imaginaries that I have been tracing throughout this thesis. As Jasanoff and Kim (2009) argue, imaginaries are not free-floating ideals but socially embedded visions of desirable futures, rooted in cultural, historical, and political contexts. In the nineteenth century, as I showed in the Cotton Famine poetry, thermodynamic ethics framed energy conservation and entropy in moralised terms, linking industrial progress to notions of virtue and waste. These moralised frameworks were themselves imaginaries: ways of imagining and legitimising particular energy futures that privileged extraction, efficiency, and accumulation.

Hayer's *North Country* complicates and updates this trajectory. By foregrounding what is abandoned as much as what is preserved, the play resists the Protestant-inflected ethic of ceaseless productivity that has historically structured energy imaginaries. Instead, it points to alternative visions shaped by diasporic and non-Western ethics of kinship and care. In this sense, Hayer's dramaturgy does not simply imagine a future after fossil fuels but interrogates the

colonial and imperial histories embedded in energy infrastructures themselves. This repositioning makes visible how imaginaries operate both as inheritances, carrying forward the moral economies of thermodynamics, and as openings to different, more relational futures. *North Country* thus exemplifies how sociotechnical imaginaries are not static blueprints but contested cultural terrains, where the legacies of energy, environment, and empire are reworked in ways that invite audiences to confront both continuity and rupture.

The narrative gains further depth when examined through the lens of Britain's industrial history, particularly the pivotal role of South Asians who migrated to work in the mills and factories of post-war Britain. These migrations were not merely economic but deeply tied to Britain's colonial past, as imperial policies established patterns of labour exploitation and resource extraction that persisted into the era of decolonisation. Scholars such as Paul Gilroy (1993) and Priyamvada Gopal (2019) have argued that the industrial growth of Britain was inseparable from the labour of colonial subjects, both in the colonies and in the metropole. South Asian workers, many of whom were recruited through imperial networks, became central to the functioning of Britain's industrial base, particularly in regions like Bradford and Manchester.

Hayer's depiction of Bradford as a microcosm of broader systemic collapse situates this history within a speculative framework. The mills and factories, powered by coal and other fossil fuels, symbolise the exploitative energy regimes that facilitated Britain's industrial dominance while also laying the groundwork for environmental degradation. The South Asian labour force, brought to Britain to sustain these industries, serves as a reminder of how the global flows of people and resources were orchestrated to maintain imperial power structures. As Chakrabarty (2000) emphasise, these flows illustrate the ways in which colonial subjects

were integral to the energy-intensive processes of industrial capitalism, even as they were rendered invisible in dominant narratives of progress.

Hayer's 'paradigm shift' can thus be read not only as a local critique of fossil-fuelled modernity but also as a call to reimagine the sociotechnical imaginaries of energy futures in light of historical injustice. By staging the collapse of energy systems in Bradford as both a material and symbolic event, he challenges audiences to weigh what aspects of these legacies are worth carrying forward and what must be abandoned. This dramaturgical tension between remembering and forgetting resonates with Chakrabarty's *The Climate of History in a Planetary Age* (2009), where he argues that climate crisis forces us to rethink history across multiple scales, human, imperial, planetary. In this sense, Hayer's work bridges the local and the global: it situates the lived experience of post-apocalyptic Bradford within a planetary reckoning that demands new forms of historical consciousness.

Through this speculative lens, Hayer not only critiques the extractive logics of empire but also invites a vision of equitable energy futures that prioritise justice and sustainability over the inequities of the past. His work underscores the necessity of confronting the colonial underpinnings of energy regimes as part of any meaningful transition to a post-carbon world.

### Staging Energy Futures: Ragged Edge and The Performance of Sociotechnical Imaginaries

These concerns, how energy is historically embedded in structures of power, and how its futures are imagined, are central to contemporary theatrical engagements with energy infrastructures across the UK. Theatre-makers are increasingly interrogating the socio-political dimensions of

energy through performance, staging not only the material realities of energy production but also the imaginaries that shape public perceptions and policy debates.

It is within this broader landscape of energy-focused performance that I situate my research on theatre projects that represent and perform sociotechnical imaginaries. One such project is a series of three short radio plays produced by Ragged Edge, a theatre company based in Cumbria. Each play examines a different energy source (nuclear, tidal, and wind) situated within the landscapes of Lancaster, Cumbria, and Morecambe Bay. Through this work, Ragged Edge engages with the entanglements of energy, place, and community, foregrounding how localised experiences of energy production intersect with national and global narratives of transition and sustainability. Ragged Edge was founded by local theatre technician, actor and later director, Stefan Escreet, my interviewee, who later became Associate Director at Theatre by the Lake in Keswick. The plays look at nuclear, tidal and wind energy respectively, and were developed in collaboration with academic experts from Lancaster University. In our conversation, Stefan referred to his intention to create a platform where stories from this particular part of the world, the North and Cumbria, would emerge but could resonate to everyone all around the world. Stefan sees the various energy sources that play out in the area as a very significant part of people's lives, especially in terms of their livelihoods. He recounts how he came about this idea:

[...] and then a rich history of energy production related industry here with coalmining history etcetera. So I thought about creating a piece of work to respond to that, it seemed to me that it's such a massive subject, I quickly arrived to the decision to commission a whole range of short pieces from writers as opposed to one standalone play.

Part of their research and development process was meeting with the experts but also touring the nuclear site of Heysham, to immerse themselves into the materialities they would be writing about. Heysham remains unchanged in its material consistency, but what is significant here is to explore what happens when it is encountered by those writers (and soon me, when I visit it in June). As Aagaard and Mathiesen argue, ‘Material artifacts are thus situationally embedded and emerge as particular artifacts in human interactions whilst at the same time inviting particular ways of participating’ (2016, p.38). Because of the pandemic, the performances were moved online, where in Stefan’s words, ‘we were trying to replicate a bit of that intimate live experience in specific places, had we been doing a rural tour in village halls. So we’d bring a community audience together who have a chance to interact with each other, you know social way, which was so important during lockdown, alongside having some provocative, inspiring, interesting material to engage with’. In this case then, the online environment is seen as familiar and intimate rather than cold and lacking the attributes that face-to-face communication usually affords. When the conversation turned to the role proximity plays in energy infrastructures, as well as the ways we construct meaning around rural, urban and energy-generation spaces, he added:

[...[ And I think I was drawn to the subject (energy) because the obvious thing is, a lot of energy production happens in rural places, as you’ve said, It doesn’t happen in Soho. You don’t get wind turbines or a coalmine or a nuclear facility at the moment. [...] It obviously affects the lives of people living alongside them and, you know also, the big, big level of employment and work which has been, you know raging up here around the controversial coal mine plan. The leader of the Council here, he was speaking passionately about employment for his people, for people locally and that can’t be ignored.

Stefan is raising a prominent theme across all sites of energy production, and especially in areas like the ‘Energy Coast’, work. Labour, economic growth, but also labour-saving regimes, are all featured in the relationship between the politics of energy and labour, following a linear, exponential relationship that has been disrupted by critical events such as economic crises, technological advances and environmental damage (Daggett, 2016). Stefan’s reflections highlight a key theme across sites of energy production, particularly in areas like the Energy Coast: labour. The relationship between energy and work is shaped by intersecting forces of economic growth, technological change, and environmental crises, disrupting conventional narratives of progress (Daggett, 2016). Yet, beyond economic structures, energy is also embedded in cultural and temporal imaginaries, how communities remember the past and anticipate the future.

It is precisely these temporal entanglements that emerge in the work of Debbie McAndrew, one of the commissioned writers for Ragged Edge’s radio plays. In *Things We Hear When We’re Not Listening*, McAndrew interrogates the ways energy histories shape contemporary concerns and future possibilities. Our conversation explored how theatre functions as a medium for navigating these temporalities, bridging past experiences of energy extraction with emerging energy futures. McAndrew’s reflection on her process reveals a nuanced awareness of how dramatists engage with sociotechnical imaginaries, using creative storytelling to reframe dominant energy discourses. Debbie noted:

Whereas in terms of discussing and(?) the complexities of the situation, to go back in time into a fixed place where you can actually point and nail down the facts much more specifically and use that as a parable for future model and for examining those things. [...] (people) making discoveries that change their world views. And this is the stuff, this is what I deal in, this is the currency I deal

in. So how does a person who deals in my currency contribute to that conversation, [...] I think that the best contribution is to put the players in the room.

This quote illustrates how McAndrew perceives her role as a dramatist, not as a provider of solutions but as a facilitator of dialogue. Her emphasis on ‘putting the players in the room’ reflects a commitment to dramatising the human and ethical dimensions of energy transitions, allowing audiences to engage with these issues in a visceral and reflective way. By using historical moments as parables, she highlights how past events can serve as models for interrogating the present and imagining alternative futures. This approach aligns with the broader cultural role of the arts in shaping sociotechnical imaginaries, as discussed by Jasanoff and Kim (2009), where narratives and cultural artifacts contribute to shared understandings of what energy futures might look like.

Debbie’s reflections also extend to her engagement with wind turbines in *Keeping the Lights On*, where she captures the evolving narratives around sociotechnical arrangements. She refers to the ‘great wind turbines’ as ‘epic’ pointing to the shifting imaginaries surrounding renewable energy infrastructure. Her reference to the NIMBYism (Not In My Backyard) around the installation of wind turbines on Haworth Moor underscores how public perception of energy technologies is entangled with place, memory, and cultural identity. This tension, between awe and resistance, highlights how sociotechnical imaginaries evolve over time, shaped by both material realities and cultural narratives.

In her work, Debbie McAndrew demonstrates how dramatists can play a pivotal role in the energy transition conversation. By situating her narratives at the intersection of the temporal, the technical, and the cultural, she offers a framework for audiences to grapple with the complexities of energy systems and their implications for the future. Her perspective as an

artist enriches the discourse, emphasising that energy transitions are not only technical challenges but also deeply human and cultural ones.

Nevertheless, she argues that ‘the same people who are now campaigning to stop those things going up will be the same people who in 100 years’ time will be campaigning to save them because they are part of the landscape’. Debbie is describing the ways in which, when it comes to thinking about energy infrastructures and time, temporalities fold onto one another and influence the ways certain energy resources are seen. Her views resonate with Jasanoff’s argument that change is a big part of sociotechnical imaginaries. She argues: ‘Past and future connect in a complex dialectic that is widely acknowledged. The past is prologue, but it is also a site of memory excavated and reinterpreted in the light of a society’s understanding of the present as its hopes for what lies ahead’ (Jasanoff, 2015). The past and its infrastructures provide both a site for revisiting the meaning and value these materialities hold, and, in the case of the playwrights, examining the ways they engage and negotiate with them. Turning to co-produced sociotechnical imaginaries can provide a lens to better understand what people hope, dream or fear about the future of our energy needs. Debbie concludes:

So I felt like they [the wind turbines] were something that I could see, that I’d heard about in the past. It also felt very sustainable, and I suppose I wanted to understand[?]. Well it’s wind isn’t it, so you know it’s there all the time and it must be completely good for the environment. But actually is it? [...] Nothing is free, so what is the cost of wind and we need to understand it and are we prepared to make that deal, because we have to keep the lights on. [...] We need energy to sustain ourselves on this planet so what are the deals we prepared to do, we cannot continue to deal with carbon. [...] so, what does wind do then, how much [does] it cost to put a turbine up and what are the materials that are used and where do they come from?

Her questions reflect broader debates in energy scholarship about the ethical and material trade offs involved in transitioning to renewable energy systems (Szeman & Boyer, 2017). By framing these dilemmas within the context of individual and collective choices, McAndrew invites her audience to confront the complexities of energy justice. Debbie also talks about embodied experience of infrastructures, when prompted about the kind of research<sup>4</sup> that went into the play.

[...] I did and the idea of infrasound, again as a sort of metaphor for stuff you can't hear but is there. Stuff you can't sort of sense, that you sense on a different level with your body. And I thought that was an interesting metaphor throughout the general conversation. [...] So as a kind of, there was a bigger metaphor for-, so this woman who's got a wind farm near her house is experiencing infrasound and the impact of infrasound on her body is causing vibration in her eyeballs and this effect on mood and so forth, and there are some funny little anecdotes about people who think they were seeing ghosts and apparitions and things like that because of the way it affects your eyesight.

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<sup>4</sup> Infrasound refers to sound waves with frequencies lower than 20 Hz, which is below the threshold of human hearing. These low-frequency sounds can travel long distances and penetrate solid objects more effectively than higher-frequency sounds.

Infrasound is naturally produced by events such as ocean waves, volcanic eruptions, and earthquakes, but it can also result from human activities, including wind turbines, explosions, and industrial machinery. While generally imperceptible to humans, infrasound has been studied for its potential physiological and psychological effects, including feelings of unease, dizziness, or anxiety in some individuals.

Her use of infrasound as a narrative device speaks to Barad's (2007) theory of agential realism, where material-discursive entanglements reveal the agency of non-human actors. The interplay between infrastructure, sensory experience, and narrative creation foregrounds the role of the body as a site of knowledge production, echoing the ethnographic emphasis on embodied methodologies (Pink, 2015). The insights from these interviews reveal the layered complexities of energy narratives as they intersect with material, temporal, and embodied experiences. Through their creative processes, Escreet and the playwrights navigate the tensions between localised energy production, broader socio-political implications, and the embodied impacts of energy infrastructures. Their reflections underscore the value of ethnographic methods in capturing the relational dynamics between material artefacts, human actors, and cultural imaginaries. By situating their work within the broader context of sociotechnical imaginaries, these playwrights contribute to a richer understanding of how energy transitions are negotiated, contested, and performed in lived experience.

### Curtain Call: Energy Takes centre Stage

Leaving behind Lancashire, my next case study turns to the more 'central periphery' of Manchester and expands the discussion of sociotechnical imaginaries through an interview with Manchester-based playwright Rob Lyons. Here, I examine how theatre functions as a participatory medium to navigate ethical dilemmas around energy futures. The focus is *Ergon: The Wicked Problem*, a production by Ergon Theatre that places the audience at the centre, blending dramaturgy with ethical inquiry. Building on themes of materiality, temporality, and embodiment introduced in the previous section, this analysis explores how the play complicates

binaries of utopia and dystopia, progress and regression, and individual versus collective accountability.

Set in 2061, *The Wicked Problem* stages a courtroom trial in which the audience must decide whether Alex Hummel, who illegally reactivated a disused coal plant, should be punished under the Ergon Clean Energy Act. By casting the audience as jurors, the play exemplifies theatre's capacity to blur the boundaries between spectatorship and action, echoing Bishop's (2012) critique of participatory art as a means of fostering critical engagement. The stakes of this choice are not abstract: Hummel's act is framed as a response to community energy rationing, heating deprivation, and job losses, raising questions about whether survival can justify actions that undermine sustainability. As Lyons reflects:

It's really exciting how galvanised people get [...] if for those ten minutes at the end of the show people have a proper conversation that's meaningful about climate change, [...] then our job's done as far as I'm concerned.

Something as simple as that completely changes everything. In some ways it progresses things in really futuristic ways. In other things it makes things go right back in time [...] the climate crisis nature is that it's so diverse and it's an umbrella that covers everything.

This participatory structure foregrounds the ethical contradictions of energy transitions: immediate needs versus long-term sustainability, local survival versus global responsibility. Rather than delivering a moral lesson, the play situates audiences within the entangled decision-making processes that characterise climate politics, implicating them in the uncertainty rather than offering resolution.

Lyons connects this dramaturgical strategy to his early exposure to ‘four futures’ frameworks, scenarios ranging from ecological collapse and authoritarian control to localised communal living and high-tech sustainability. ‘Something as simple as that completely changes everything. In some ways it progresses things in really futuristic ways. In other things it makes things go right back in time [...] the climate crisis nature is that it’s so diverse and it’s an umbrella that covers everything.’ His remark underscores the nonlinear temporality of climate futures, resonating with Serres’ (1995) insistence that time is never linear but always folded, where past, present, and future are entangled and mutually constitutive.

By weaving these temporal imaginaries, the play resists the easy categorisation of futures as either utopian or dystopian. Instead, as Atwood (2011; 2015) argues in her analysis of speculative fiction, utopia and dystopia function as interdependent lenses, each shaping the other. *Ergon: The Wicked Problem* mirrors this interdependence, presenting futures where technological innovation coexists with regression, and where ethical dilemmas demand deliberation rather than closure. The trial format literalises this interdependence by demanding that the audience (as jury) embody both hope and despair, both justice and complicity.

At its core, the play stages the thermodynamic legacy of fossil-fuelled infrastructures. Hummel’s decision to reignite coal power literalises the entropic dilemma at the centre of industrial modernity: does one prioritise immediate use of energy to secure survival, or conserve resources for future generations? This recalls the Victorian debates around entropy and moral order explored in earlier chapters, where Cotton Famine poets wrestled with the ethics of energy scarcity and the fear of irreversible loss. In Ergon’s courtroom, this genealogy reappears in a new guise: the same entropic dilemma, reframed through climate change, austerity, and global inequality.

What distinguishes *Ergon: The Wicked Problem* from earlier cultural texts is its insistence that thermodynamic ethics cannot remain abstract. By making the audience complicit in Hummel's fate, the play insists that energy ethics are lived, embodied, and unavoidable. The decision cannot be outsourced to experts or delayed for future generations; it is immediate, participatory, and collective. In this sense, the play dramatises the argument made by Jasanoff and Kim (2009): sociotechnical imaginaries are not only articulated in policy and technology but are actively co-produced in cultural practices. Here, theatre itself becomes a site of co-production, collapsing the boundary between analysis and action.

By embedding its audience within these ethical entanglements, *Ergon: The Wicked Problem* demonstrates how dramaturgy can reconfigure thermodynamic ethics for the Anthropocene. The courtroom becomes a stage for negotiating survival, justice, and responsibility across scales, from the intimate to the planetary. In so doing, the play exemplifies theatre's unique capacity to stage climate politics not as a distant abstraction but as a pressing, embodied dilemma, where history and future converge in the immediacy of performance.

These dilemmas reflect broader societal debates surrounding climate change and energy justice, highlighting the trade-offs between individual and collective responsibilities. Thermodynamic ethics emphasises that energy systems are not just technical or economic constructs but deeply moral and social phenomena. Decisions about energy consumption, transition, and equity are shaped by thermodynamic imaginaries - shared understandings of energy's role in shaping human and ecological futures. Thermodynamic imaginaries are central to energy transitions because they frame how societies conceptualise the flow, use, and governance of energy. As energy transitions inevitably involve rethinking the material and ideological infrastructures of energy regimes, thermodynamic imaginaries influence not only technological shifts but also cultural and ethical priorities. The play's focus on these

imaginaries, through its entangled temporalities and decision-making framework, illustrates how energy narratives are inextricably linked to questions of justice, sustainability, and the long-term viability of human and non-human systems. By placing these abstract concepts into a dramatic, participatory context, *Ergon: The Wicked Problem* deepens the audience's engagement with the moral dimensions of energy transitions. My own experience as a spectator-participant underscored how the process of decision-making foregrounds the affective and embodied dimensions of energy imaginaries. The vacillation within my group, whether to convict Alex or acquit him, revealed the tensions between ethical absolutes and pragmatic considerations, mirroring the complexities of real-world energy policy debates.

It's a show that is, you can't not discuss it. It can't not spark a debate, it's just impossible I think.

This aligns with Nixon's (2011) concept of 'slow violence,' as we have seen previously in this thesis. The harms of fossil-fuelled infrastructures and their 'afterlives' are rarely immediate or spectacular; instead, they are dispersed across time, disproportionately borne by marginalised communities, and often rendered invisible in policy discourse. The urgency of addressing these inequalities was starkly highlighted at COP29, where climate negotiations were marred by controversy. Human Rights Watch (2024) criticised the draft agreements as 'shamefully inadequate,' noting that they ignored core human rights principles and instead prioritised economic growth over equitable and just solutions. The urgency of addressing these inequalities was a theme that Rob Lyons himself emphasised in our conversation, drawing a direct line between the ethical dilemmas staged in *Ergon: The Wicked Problem* and ongoing climate negotiations. As he put it:

If they don't have the infrastructure, the resources to transition, then in many ways the West keeps certain things the way they are because they can exploit other areas of a resource-rich country, then up to a point, I find it even a little bit hypocritical to be honest, you know.

By foregrounding the ethical implications of energy transitions, *Ergon: The Wicked Problem* invites audiences to consider the global inequalities embedded in climate policies. The play highlights how these power imbalances structure the transition to renewable energy, echoing Chakrabarty's (2009) call for a postcolonial critique of the Anthropocene. This perspective is further reinforced by the selection of Azerbaijan, a major fossil fuel producer, as the host of COP29, an ironic choice given the conference's stated commitment to decarbonisation.

Exactly, I totally agree with you. It is the way it is. Like if you look at it per capita then the whole picture changes.

This emphasis on equity is integral to reimagining energy futures. *The Wicked Problem* challenges its audience to confront their complicity in systems of exploitation while acknowledging the constraints that different communities face. The creators' deliberate focus on narrative as a tool for engaging with energy imaginaries underscores the performative power of storytelling. Lyons describes the development process as a collaborative effort involving 30 to 40 creatives, each contributing to the play's rich narrative texture:

It had legs to not just be one idea but to be many [...] the storytelling should be and is endless within that kind of umbrella.

This multiplicity aligns with Haraway's (2016) notion of 'staying with the trouble', where narratives become a means of grappling with the complexities of climate change rather than seeking resolution. By situating the audience within the narrative's ethical framework, *Ergon*:

*The Wicked Problem* exemplifies how theatre can serve as a medium for co-producing knowledge about sociotechnical imaginaries. It creates a space where ethical, cultural, and emotional dimensions of climate transitions are made tangible, inviting audiences not only to witness but also to participate in the collective effort to reimagine equitable energy futures.

## Conclusion

This chapter explored how contemporary theatre engages with the sociotechnical imaginaries of energy, demonstrating the ways in which playwrights and theatre practitioners articulate, challenge, and reimagine the ethical, material, and affective dimensions of energy transitions. Through my interviews with playwrights, it became evident that theatre is not simply a space of representation but an active site where audiences are invited to participate in ethical inquiry, material exploration, and embodied reflection. The interviews examined in this chapter demonstrate that energy transitions are not merely technological shifts but are deeply embedded in the histories of fossil capitalism, colonial extractivism, and enduring thermodynamic imaginaries. Engaging directly with the creative practitioners behind these narratives extends the dialogue beyond the stage and into the academic sphere, adding layers of analysis and

ensuring that these otherwise finite performances contribute to a broader archive of knowledge. Academia functions as a tool for preserving and disseminating these situated knowledges, allowing them to enter critical discourse, shape future scholarship, and reach audiences beyond the temporality of live performance. By transferring these conversations into a different setting, theatre's interrogation of energy imaginaries is not only documented but also expanded, reinforcing its role in challenging dominant narratives and offering alternative perspectives on sustainability and energy transition. In doing so, this process ensures that the affective, spatial, and material dimensions of energy systems, so powerfully explored in performance, become part of a wider, ongoing discourse that informs both academic and public understandings of energy futures.

Building on my earlier analysis of *North Country*, *The Wicked Problem*, and the work of *Ragged Edge Theatre*, I have explored how these plays situate energy infrastructures within embodied and social registers. Tajinder Hayer's reflections on abandoned power stations and nuclear facilities in *North Country* illustrate how post-apocalyptic storytelling is intimately connected to real-world anxieties about energy dependency and environmental collapse. Similarly, Debbie McAndrew's engagement with wind energy and nuclear power in *Things We Hear When We're Not Listening* foregrounds how creative practitioners use theatre and radio drama to investigate the ethical dilemmas posed by energy infrastructures and the ways in which energy imaginaries shape our understanding of the past and the future.

This chapter has also underscored how *Ergon: The Wicked Problem* complicates the traditional boundaries between spectatorship and action, turning the audience into active participants in the ethical dilemmas of energy justice. By positioning the audience as jurors in a trial that determines the fate of Alex Hummel, who reactivates a coal power station under the Ergon Clean Energy Act, the play enacts what Bishop (2012) describes as the 'performative

turn', in which participation itself becomes a mechanism of critique. This form of theatrical engagement forces audiences to grapple with the contradictions and moral ambiguities inherent in energy transitions. As one of the play's creators, Robyn Lyons, remarked:

It's really exciting how galvanised people get [...] if for those ten minutes at the end of the show people have a proper conversation that's meaningful about climate change, [...] then our job's done as far as I'm concerned.

These participatory performances do not merely mirror debates on climate and energy transitions but actively produce them, making visible the ethical and material tensions that govern contemporary energy imaginaries. The performative nature of these encounters, where the audience must make a decision that is ultimately impossible, foregrounds the inescapable entanglement of human agency, technological infrastructures, and the irreversible thermodynamic conditions of energy systems. A key thread throughout this chapter has been the persistence of thermodynamic ethics—the moral and political implications embedded in how energy is produced, distributed, and consumed. In *Ergon: The Wicked Problem*, for instance, the trial of Alex Hummel encapsulates the broader paradox of energy governance: does the immediate need for energy justify actions that compromise long-term sustainability? Should present generations prioritise their survival over the preservation of energy resources for posterity?

These questions are not new but have historical precedence in thermodynamic imaginaries, the ways societies conceptualise the flow and governance of energy. As Schuster (2016) notes, the 19th-century understanding of energy as a finite, extractable force gave rise to an ethics of scarcity, where conservation became both a scientific principle and a moral imperative. This principle remains deeply embedded in contemporary climate discourse, shaping both the utopian aspirations and dystopian anxieties that inform energy transitions. The

tension between conservation and dissipation is thus not only a technical matter but also a deeply social and political one, affecting how energy futures are conceived and enacted.

The interviews conducted in this research highlight how contemporary playwrights are acutely aware of these entangled histories. Hayer's portrayal of post-industrial Bradford as a microcosm of energy collapse foregrounds how the legacies of thermodynamic ethics persist in postcolonial and working-class geographies. His narrative, which envisions a world where energy infrastructures deteriorate without human oversight, mirrors broader anxieties about the unsustainability of existing energy regimes. Likewise, McAndrew's concern with the shifting cultural meanings of wind turbines reveals how renewable energy infrastructures are often entangled with historical landscapes of labour and extraction. Her remark – 'the same people who are now campaigning to stop those things going up will be the same people who in 100 years' time will be campaigning to save them,' underscores how infrastructures acquire new social and political significance over time, folding past and future imaginaries into one another.

Beyond the technical and moral dimensions of energy, this chapter has also underscored the embodied and affective registers of energy imaginaries. As the playwrights I interviewed articulated, theatre's capacity to engage the senses plays a crucial role in how audiences perceive and respond to energy transitions. *The Wicked Problem*, by keeping the house lights on and positioning the audience as an active participant in the trial, ensures that spectators cannot passively consume the performance; they must inhabit the ethical dilemmas it presents. Similarly, McAndrew's exploration of infrasound in *Things We Hear When We're Not Listening* highlights how energy infrastructures are not only seen but also felt, sensed, and experienced on a bodily level. Her reflections on wind turbine vibrations and their sensory impact echo Barad's (2007) theory of agential realism, which emphasises how material discursive entanglements shape human and non-human interactions. By bringing these sensorial and

participatory dimensions into focus, the plays examined in this chapter challenge dominant paradigms of energy transition discourse, which often prioritise technocratic and policy-driven solutions over embodied and lived experiences. They reveal that energy justice is not only a question of material distribution but also of narrative agency, cultural memory, and the capacity to imagine alternative futures.

Theatre serves as a critical site for resisting dominant energy regimes while offering alternative ways of thinking about sustainability, justice, and planetary survival. The playwrights and theatre-makers interviewed in this research demonstrate that narrative agency is a crucial component of energy transitions. As Haraway (2016) argues in *Staying with the Trouble*, the future cannot simply be planned through abstract models or technocratic interventions; it must be enacted through collective storytelling, situated knowledge, and affective engagement. One of the most striking insights that emerged from this research is the potential for theatre to contribute to an energy commons, a concept that envisions energy as a shared resource managed collectively rather than controlled by corporate or state actors (Burke & Stephens, 2017). The idea of an energy commons disrupts the dominant logic of energy as a commodity and instead frames it as a site of cooperation, mutual responsibility, and ethical negotiation.

Ultimately, these performances do not offer easy resolutions, nor do they present energy transitions as linear progressions towards an inevitable renewable future. Instead, they create spaces for negotiation, contradiction, and ethical reckoning, compelling audiences to confront the complex realities of energy governance. If sociotechnical imaginaries shape the coevolution of technology and society (Jasanoff & Kim, 2009), then artistic and participatory engagement with energy must be recognised as a vital force in shaping the possibilities of a more just and sustainable future. As I continue this research, I will further explore how these narratives

intersect with broader policy frameworks, public discourse, and activist interventions. The engagement with thermodynamic ethics, in particular, will be crucial in understanding how energy justice can move beyond abstract principles into tangible, lived experiences.

#### Chapter Four: From Nuclear Imaginaries to Energy Politics: Reimagining Futures in The North West of England

The previous chapter examined how playwrights engage with energy imaginaries, showing how theatrical narratives stage ethical dilemmas of justice, temporality, and accountability. Through interviews and performance analysis, I argued that theatre offers speculative spaces where audiences are invited to imagine transitions differently. These cultural artefacts demonstrate how creative practice can make energy visible, dramatise ethical questions, and foreground uncertainty.

In this chapter, I shift from cultural artefacts to the geographies of England's Energy Coast. This move requires clarification. If the previous analysis was grounded in cultural production, this chapter considers how imaginaries circulate in everyday life, among those who live alongside and within infrastructures. The move is not a departure but a necessary extension: imaginaries are not confined to stages or scripts but materialise in policy documents, visitor centres, public

consultations, and community memory. To keep this wide-ranging material cohesive, I organise the chapter around two interrelated strands. The first explores personal and community imaginaries i.e., how residents, campaigners, and activists articulate counter-narratives shaped by memory, risk, and economic precarity. The second considers institutional and policy imaginaries; how state agencies, industry actors, and official narratives construct infrastructures as necessary, safe, and engines of growth. These two registers are always entangled: institutional stories of safety depend on the silencing of local testimony, while personal narratives of harm often re-emerge in policy debates.

Rather than treating energy infrastructures as neutral technical achievements, I follow Jasanoff and Kim's (2009) and Daggett's (2019) insistence that infrastructures are contested sociotechnical formations, always embedded in histories of extraction, development, and risk. Testimonies from my fieldwork demonstrate how economic dependency, political contestation, and personal adaptation shape everyday encounters with nuclear plants, proposed coal mines, and the anticipation of geological disposal facilities. These lived accounts provide a necessary counterpoint to policy frameworks that often portray transitions as technocratic, orderly, and inevitable, revealing instead the uneven distributions of benefit and harm.

The 'Energy Coast' is a crucial site for examining these tensions. Encompassing Cumbria and West Lancashire, the region has long been narrated as a hub of energy production, from Sellafield's nuclear legacy to more recent proposals for shale gas and wind energy. Yet this narrative of progress is fractured. Local residents express ambivalence: infrastructures bring jobs and regional investment, but also revive memories of accidents, expose ecological vulnerabilities, and intensify anxieties over future disposability. These conflicting imaginaries echo the themes of justice and responsibility that surfaced in my interviews with playwrights, but here they emerge not as staged dilemmas but as lived contradictions.

Transitions are never just about replacing one fuel with another; they reshape landscapes, redistribute risks, and reconfigure relations of accountability. In the previous chapter, I examined how *Ergon: The Wicked Problem* invited audiences to deliberate on these complexities. Here, I extend this inquiry by considering how communities outside the theatre navigate similar questions through direct encounters with infrastructural change, economic instability, and shifting policy regimes.

By structuring the analysis around institutional narratives and personal testimonies, I show how storytelling, whether in policy documents, official projections, or grassroots accounts, functions as the connective tissue of energy imaginaries. Just as theatre dramatises speculative futures, community narratives dramatise the contradictions of living within energy transitions. This move from artistic representation to lived experience underscores the entanglement of energy systems with social, economic, and cultural structures, demonstrating that energy transitions are not simply technological matters but deeply embedded in the rhythms of daily life.

Throughout my ethnographic research, it became clear that debates about energy transitions are ultimately debates about ownership, responsibility, and justice—what Boyer and Szeman (2014) describe as the struggle over the energy commons. Who has the authority to decide how energy is produced and where waste is stored? Whose futures are safeguarded in energy planning, and whose lives are rendered expendable? By addressing these questions through the lens of both institutional and community imaginaries, this chapter foregrounds the contested terrain of Northwest England's energy geographies, and the thermal politics that emerge from them.

The testimonies of those I interviewed reflect these tensions. Some participants expressed frustration at the ways energy decisions are imposed upon them without meaningful consultation, while others spoke about the need to reclaim infrastructures for local benefit. This

perspective resonates with critiques of extractivist energy models that prioritise growth over care, often sidelining questions of social and environmental well-being. As Puig de la Bellacasa (2017) argues, ethical transitions cannot be limited to technocratic fixes; they must foreground interdependence and collective responsibility. Nixon's (2011) concept of slow violence is equally pertinent, since many of the harms tied to energy infrastructures such as pollution, displacement, environmental degradation unfolds incrementally, disproportionately borne by marginalised groups and rarely acknowledged within official accounts.

Placing these interviews in dialogue with cultural and literary narratives highlights how imaginaries are not only staged or represented but lived, contested, and embodied. Ethnographic encounters add depth to theoretical frames such as thermodynamic ethics and sociotechnical imaginaries by situating them within the memories, attachments, and losses of specific communities. Meaning, in this context, is forged affectively and materially: infrastructures are inscribed with memory and emotion, even as they are narrated by the state in the language of 'jobs' and 'growth.' These competing framings create ambivalence, suspicion, and resistance.

Before turning to specific artefacts and case studies, it is necessary to foreground the locality itself. The 'Energy Coast' is more than a geographical backdrop; it is a palimpsest of infrastructures whose afterlives and anticipations continue to shape imaginaries. This chapter therefore proceeds in two movements. First, I trace a genealogy of infrastructures in North Lancashire and Cumbria, outlining how they are woven into wider energy systems and state imaginaries. Secondly, I analyse the multiple narratives that emerge around these infrastructures, testimonies gathered through participant interviews, observations at community events, and encounters with creative responses, examining how they reinforce or unsettle official projections and how they mobilise affective politics.

Sellafield, once a functioning nuclear power station and now a reprocessing and waste site, exemplifies how infrastructures persist as material and symbolic anchors. Alongside it, the spectre of new projects—the Geological Disposal Facility for nuclear waste, or the proposed Cumbrian coal mine—illustrates how infrastructures can resist or reconfigure state narratives, acting as embodied actors in reciprocal relation to the communities in which they are embedded.

Infrastructures, then, must be read simultaneously as material, social, and temporal entities. They absorb affective investments, carry the weight of deterioration and decay, and generate new forms of attachment. As Dalakoglou and Penn (2016) note, infrastructures are designed to facilitate mobility and sustain labour systems; yet, as Larkin (2013) and Daggett (2019) show, they also produce sensorial and political experiences. In North Lancashire and Cumbria, infrastructures are never only technical systems. They reappear and recede across time: coal mines are proposed, suspended, and re-imagined; Such perceptions complicate official claims of innovation by embedding infrastructures within longer temporalities of industrial rise and decline.

Much of the symbolic meaning of infrastructure resides in its projection into the future (Harvey & Knox, 2014). Yet what emerges in my fieldwork is a layering of temporalities: infrastructures are remembered through the accidents and contaminations of the past, lived through present uncertainties, and anticipated as promises or threats in the future. This temporal layering destabilises narratives of linear progress and reveals the fragility of state sociotechnical imaginaries.

In this chapter, I analyse encounters with infrastructures attending to the ways people who live in proximity to energy materialities embody such experiences. In particular, I am looking at a fully operational power plant that produces electricity (Heysham), and the narratives constructed in a guided tour, but also people who experience it close to where they

live. I argue that energy infrastructures are co-constructed by communities living in proximity, and act as political intermediaries (Amin, 2014). Following a line of thinking that sees human and non-human entities as entangled and viewing energy infrastructures as sociotechnical assemblages that are ‘lively’ (Amin, 2014) or ‘enchanted’ (Knox and Harvey, 2012). Public discourses of progress, modernity, growth and wellbeing usually form forces of symbolic power like the state, come in direct opposition with discourses of public health, anxieties about future generations and climate change. The different narratives that I examined both in the form of the websites, the events I attended and the conversations I had with participants, highlight different kinds of attachments to the infrastructures and materials, and consequently different sentiments regarding their impact on affect and aesthetics.

As Ash Amin argues in *Lively Infrastructure* (2013), ‘Though no substitute for political economy, ethnographies of material culture can help to reveal added matter for a politics of social recognition and justice, matter that might prove to be more than marginal’ (p. 156). Infrastructures are not passive backdrops: they are constructed, operated, and maintained, but they also mobilise human actors, shaping their forms of participation in activism, creative work, and everyday life. They dictate, at least in part, the *modus operandi* of communities living in proximity to them (Amin, 2014). The anticipation of new projects, such as the proposed Geological Disposal Facility (GDF) for nuclear waste or attempted shale gas extraction sites, demonstrates how infrastructures function as more than physical artefacts: they act as assemblages of human and non-human ‘congregations’ (Bennett, 2010), entangling geology, technology, politics, and community imaginaries.

Interviews with participants confirm that these infrastructures are not simply imposed from above but are continuously interpreted and reinterpreted by those who live alongside them. Politics must therefore acknowledge that subjectivities are formed and reshaped through these

material entanglements (Guattari, 2005). As Knox and Harvey (2012) observe, ‘The processes by which rational projects of technological development are able to enact their promises start to become more comprehensible when we begin to pay attention to the affective engagements which accompany developmental processes.’ Infrastructures dazzle: they generate illusory effects of certainty and inevitability, supported by numbers, graphs, and projections (Harvey & Knox, 2005, p. 534).

This is particularly relevant in the context of contemporary energy discourse, where infrastructures are framed as solutions to crises. Their promises are underwritten by technical data and economic modelling, which present them as rational, efficient, and necessary. Yet the engagements they elicit are not reducible to technical or economic terms. They are also affective and political, experienced as hope, anxiety, or resistance. Communities must navigate not only the material presence of nuclear facilities, fracking sites, or wind farms, but also the narratives imposed by industry, policymakers, and media. These narratives often obscure the lived impacts of energy systems, effacing the complex emotional and ethical responses of those most directly affected. The gap between the dazzling promises of technological progress and the realities of communities underscores the central argument of this chapter: energy infrastructures cannot be understood solely as technical systems but must be approached as sites of contested imaginaries, shaped by both institutional projection and lived experience.

Energy infrastructures are inherently spatially and temporally bound, reflecting global trends, such as neoliberalism and new forms of colonisation, and national policies, including community partnerships and shifting political agendas. My research indicates that local responses to these pressures manifest in diverse forms of civil opposition. Such resistance is visible both online, through platforms like Facebook groups and dedicated websites, and offline, where communities organise rallies featuring merchandise and pamphlets that

challenge dominant processes of knowledge production and distribution. As Harvey (2010) argues, infrastructures not only promise economic growth and progress but also propagate narratives that marginalise local histories and knowledges. For instance, in the debate over fracking, protest participants frequently adopt a global perspective. Similarly, opposition to the proposed mine and Geological Disposal Facility (GDF) in Cumbria is deeply intertwined with historical memory. The legacy of Nirex's activities in the 1990s (which positioned Cumbria as a potential site for the disposal of radioactive waste) continues to influence contemporary resistance. Nirex, the Nuclear Industry Radioactive Waste Executive, was established to develop strategies for the safe management and disposal of radioactive waste in the UK. Its controversial proposal during the 1990s to locate a deep geological repository in Cumbria ignited significant public concern over environmental risks and local impacts, setting a precedent that still resonates with communities today. For example, a protest outside the Home Office in London on 1 December 2022 featured a banner declaring 'No New Coal (BBC News, 2022). Protesters invoked Cumbria's 'dirty' coal history as a powerful reminder of past injustices, striving to preserve this memory as a safeguard against future resource exploitation. These state-supported infrastructures can be understood as attempts to erase or overwrite local identities, particularly those rooted in rural landscapes and traditional livelihoods. Communities, however, actively resist such erasures by asserting their roles as stewards of their land. Katherine Lawless (2021, p.77) offers a pertinent analytical perspective, arguing that:

Memory is implicated in the forms of exploitation that accompany the new global enclosures; and that the dispossession of knowledge reinforces material dispossessions. Sites of memory, in other words, are also sites of enclosure, operating according to a logic that conceals cycles of accumulation and dispossession through the preservation of the material remains of previous stages of accumulation.

This framework illuminates the broader struggle at play. On one side, state and industry promote a job-creation narrative that reinforces a sociotechnical imaginary of limitless growth—a central tenet of late capitalism. On the other side, local communities counteract this narrative by cultivating alternative forms of knowledge production, cultural storytelling, and resource aesthetics. These efforts represent a deliberate attempt to safeguard collective memory and local identity against the backdrop of global economic pressures. By interrogating the interplay between material infrastructures and cultural memory, this analysis highlights how community resistance is not merely reactive but is an active, creative process of re-inscribing local histories and values. In doing so, it challenges dominant energy narratives and opens up possibilities for more inclusive, just approaches to managing energy futures.

### ‘Risky’ Materials, Energy Narratives, and Pending Infrastructures: Ethnographic Insights from North Lancashire and Cumbria

When I arrived in Lancaster to begin my PhD at the Institute for Material Social Futures in September 2019, the ‘Energy Coast’ was already in flux. That summer, Cuadrilla Resources had halted fracking at the Preston New Road site after a 2.9-magnitude earthquake on 26 August, an event that precipitated the government’s moratorium on fracking in November 2019. Only days before, protesters had marked one thousand days of resistance at the site (Drill or Drop, 2019). In West Cumbria, permission had just been granted for a new coal mine to supply metallurgical coal for the steel industry, though local campaigners immediately raised doubts about the mine’s environmental risks and the sulphur content of its coal. After years of controversy, the project was blocked in 2023 when the High Court ruled the planning

permission legally flawed. Simultaneously, the Nuclear Waste Services launched a new process to identify a site for the geological disposal of higher-activity radioactive waste, establishing three ‘community partnerships’ in Mid Copeland, South Copeland, and Allerdale.

These overlapping developments form what I describe as a palimpsest of energy materialities in Northwest England: abandoned fracking sites, suspended coal projects, and pending nuclear disposal facilities layered onto the region’s longer nuclear legacy. They are examples of what this chapter terms ‘pending infrastructures’—projects continually proposed, debated, or resisted but rarely fully realised. Their anticipation alone shapes imaginaries, inflecting how communities understand risk, responsibility, and the future.

My ethnographic research, conducted between 2019 and 2022, traced these contested landscapes through semi-structured interviews and participant observation. Because of the COVID-19 pandemic, much of this work took place on digital platforms. Facebook groups in particular served as crucial entry points: they were virtual spaces where communities organised, circulated information, and coordinated resistance. These online arenas did not replace place-based activism but complemented it, creating a hybrid terrain in which local and digital struggles were intertwined (Pickerill, 2003).

This methodological shift sharpened my focus. Rather than treating social media content as an object of analysis in itself, I used these groups to identify participants whose perspectives could anchor my ethnography. Interviews then became the core of my method, bringing forward the personal testimonies of residents, campaigners, and activists whose lives are entangled with infrastructures of energy extraction, storage, and waste. In this way, digital spaces acted as conduits into lived experience rather than as standalone data sources.

The significance of these groups lies in how they linked institutional narratives with community imaginaries. They were spaces where official projections of growth, safety, or national necessity could be interrogated and contested; where memories of nuclear accidents were resurfaced; and where alternative visions of energy futures were crafted. By following these mediated connections into interviews, I was able to situate the abstractions of energy policy alongside the embodied experiences of those most affected by it. The participants I interviewed were often connected through overlapping activist networks that blurred the boundaries between local campaigns and national movements. Groups such as Radiation Free Lakeland, Keep Cumbrian Coal in the Hole, and Lakes Against Nuclear Dump mobilised around nuclear waste and coal projects in Cumbria, while Lancaster Fights Fracking and Nanashire emerged in opposition to shale gas extraction in Lancashire. These groups frequently interacted with broader movements such as Extinction Rebellion and the Campaign for Nuclear Disarmament, linking regional concerns to wider struggles for climate justice and demilitarisation.

What unites these networks is their dual focus on place and infrastructure. Each group situates its activism in a specific landscape, be it the Lake District, the Lancashire shale beds, or the coastal communities around Sellafield—yet all position these sites within broader questions of risk, accountability, and energy justice. Their digital presence, particularly on Facebook, served not only to organise protests and share reports but also to sustain community memory, making visible connections between past harms, present uncertainties, and anticipated futures.

Rather than treating these groups as discrete objects of analysis, my approach was to follow them ethnographically as conduits into individual testimony. Activists encountered online later became participants in interviews, where they articulated how their involvement was shaped by both personal experience and mediated forms of knowledge exchange. In this way, the groups

were less research ‘subjects’ in themselves than pathways into understanding how imaginaries of risk and responsibility are collectively forged.

By making use of these online spaces to identify participants, I was able to access diverse perspectives on how energy infrastructures impact daily life, economic stability, and environmental concerns. However, my study remains firmly anchored in ethnographic research, prioritising personal narratives over digital interactions. While the presence of these activist groups is important in shaping public discourse around energy materials, their role in this research is limited to providing a pathway to recruitment rather than serving as objects of analysis in themselves. This clarification ensures that my work remains focused on the lived experiences of those affected by energy infrastructures, rather than broadening into an analysis of online activism or multi-method approaches. By situating my research within an ethnographic framework, I contribute to discussions on energy imaginaries, justice, and infrastructural transitions without conflating digital activism with the core methodological focus of my study.

While institutional actors foreground narratives of safety, transparency, and economic benefit, local activists and residents articulate nuclear imaginaries in ways that emphasise memory, embodied risk, and suspicion. Connecting this to my broader ethnographic research, I observed how policy performances like the GDF event intersect with lived experiences of nuclear governance, as evidenced by David’s account of Sellafield and its long-standing risks. His frustrations with media inattention and institutional secrecy mirror the very mechanisms through which infrastructures like the GDF gain legitimacy, by strategically managing visibility and framing risk in ways that appear controlled and resolvable.

## Grassroots Testimonies and Infrastructural Contestation: Semi-Structured Interviews with David and Dolores

The interviews with David and Dolores provide an entry point into how energy infrastructures are lived, remembered, and resisted in Northwest England. Both interlocutors articulate perspectives that unsettle institutional framings of nuclear and energy transition, foregrounding instead the affective, historical, and place-based dimensions of infrastructural life. Their testimonies demonstrate how everyday actors not only contest official narratives but also reconfigure what counts as legitimate knowledge in debates over energy futures.

David's testimony highlights how institutional discourse and grassroots resistance remain locked in tension, underscoring the ongoing struggle over whose knowledge and concerns are recognised in shaping energy futures. I encountered him through participant observation in the Facebook group *Radiation Free Lakeland—nuclear landfill/geological dump NO TA!*, where residents and activists debated nuclear waste disposal, Sellafield, and related infrastructures. A long-time resident of Cumbria and veteran anti-nuclear activist, David's perspective illustrates how infrastructures are not only planned and regulated through institutional imaginaries but also lived and contested through memory and community experience.

One of his central concerns is the Cumbrian Mud Patch, an area of seabed near Sellafield contaminated by radioactive particles from decades of nuclear discharges. This contamination exemplifies what Hecht (2012) terms 'nuclearity': the ways nuclear hazards are socially recognised or denied across time. These infrastructural spillovers (where industrial activity leaves legacies that persist beneath the surface) complicate public discourse on risk. David also recalled the Windscale accident of 1957, the most severe nuclear disaster in Britain, when a fire in one of the reactors released radioactive contamination into the surrounding environment.

Though officially contained decades ago, the Windscale fire remains culturally present in local memory. As David recounted:

Well my experience of Sellafield goes back to when it was Calder Hall when it was a nuclear power station. They had a terrible fire there in 1957 and I was at college at that time with somebody who came from Gosforth in Cumbria from a dairy farm. It was an agricultural college. And the next year he died from leukemia. That was after the fire.

David's testimony exposes how nuclear accidents are remembered not only through technical reports but also through experiences of loss, grief, and uncertainty. His classmate's leukemia diagnosis following the fire illustrates how nuclear risk is embodied intergenerationally, leaving what Bickerstaff (2012) calls 'temporal spaces where what is historically distant remains culturally present.' These memories persist even as official narratives stress containment and safety, generating what I call an undercurrent of denial: awareness is present, but often unarticulated in public discourse.

David also drew connections between Sellafield's legacy and the more recent proposal for a coal mine in Cumbria, eventually rejected in 2022 (Harvey, 2022). For him, the coal mine reactivated dormant nuclear anxieties, foregoes public attention—controversy followed by silence, concern followed by forgetting—through which infrastructural imaginaries circulate. This cyclical forgetting is compounded by economic dependency: as David put it, 'Most people don't... they deny it,' suggesting a reluctance to confront risks that could destabilise the region's nuclear employment base.

Sellafield thus emerges as both a site of memory and of denial. The unresolved contamination of the Cumbrian Mud Patch functions as a reminder of long-term ecological consequences,

while the proposed coal mine raised fears of destabilising already contaminated land. These concerns illustrate what Graham and Thrift (2007) call the ‘vertical politics’ of infrastructure, where subterranean risks, fault lines, unstable rock, radioactive sediment, intersect with surface struggles over jobs, governance, and accountability. For David, these infrastructures are active ‘actants’ (Latour, 2005), non-human entities that shape social life as much as they are shaped by it.

His frustration at the lack of recognition from media and policymakers points to the difficulties of addressing multi-scalar risks through governance frameworks that compartmentalise rather than connect issues (Harvey & Knox, 2015). It also highlights how denial operates institutionally as much as individually: by sidelining nuclear questions in the coal mine debate, both media and political actors reinforced fragmented imaginaries that obscured systemic entanglements.

David’s testimony thus exemplifies the personal/community strand of nuclear imaginaries. His narrative demonstrates how infrastructures are experienced through memory, affect, and embodied histories of risk. By situating Sellafield and the coal mine within a continuum of unresolved legacies, he resists the state’s projection of progress and growth, and instead foregrounds precariousness, persistence, and injustice as defining features of Northwest England’s energy geographies.

At the same time, David’s frustration with the lack of media coverage and political accountability underscores the structural invisibility of these issues. This echoes Barad’s (2003) critique of representationalism, which argues that dominant narratives often obscure the material-discursive entanglements that shape public understanding of energy systems. By sidelining the nuclear aspects of the coal mine debate, both media and political actors reinforce a fragmented view of energy infrastructures, undermining efforts to address their cumulative

impacts comprehensively. His reflections point to a broader need for community-centred narratives that foreground the lived experiences and knowledge of those directly affected by energy infrastructures. As Boyer (2019) argues, energy transitions must be understood not only as technological shifts but as socio-cultural processes that engage with issues of justice, memory, and agency. By connecting the historical legacies of Sellafield and the Windscale accident to contemporary debates about the coal mine, this section highlights the importance of integrating local knowledge into broader discussions of energy policy and governance. David's insights illustrate the intricate entanglements of energy infrastructures in Cumbria and their socio-environmental implications. He highlights the overlapping presence of nuclear and coal-related activities, emphasising how infrastructures like Sellafield and the proposed coal mine coalesce to shape the material and affective landscapes of the region. This concept resonates with Liboiron et al. (2018), who argue that 'toxic suffering' emerges from prolonged exposure to hazardous materials and a lack of systemic accountability. His frustration at the lack of transparency and accountability is evident:

Even the BBC is not reporting. I've sent emails to BBC reporters about it and they've not even responded. The local officials, the mayors, they're looking for votes to get work so they blindly want the mine to get work for people. But they're not even acknowledging that the world's against it.

This testimony highlights the perceived collusion between media, local politicians, and industrial interests in perpetuating state-sponsored sociotechnical imaginaries (Jasanoff, 2015) of economic growth through infrastructural projects. The 'blind' pursuit of jobs reflects a broader pattern of neoliberal governance, where local stakeholders are incentivised to prioritise economic development over environmental and public health concerns (Amin, 2014). David's invocation of global resistance – 'the world's against it' – illustrates how local struggles against

energy infrastructures are intertwined with transnational movements for environmental justice, challenging the boundaries of local versus global resistance (Marres, 2007).

His testimony also underscores how historical memory continues to shape resistance to energy infrastructures. Recalling the collapse of a mine in Millom and the radioactive contamination near Sellafield, David's account exemplifies what Bickerstaff (2022) calls the cultural presence of historically distant yet materially persistent events. The contamination of sediment near St Bees Head and the potential destabilisation caused by mining highlight the cumulative and interconnected nature of environmental risks, reinforcing Lawless's (2020) assertion that sites of memory are also sites of enclosure, where cycles of accumulation and dispossession are reproduced.

David also alludes to the material consequences of these infrastructures:

There's a huge patch of sediment under the sea just off St Bees Head, and it's contaminated with nuclear particles. The galleries will go right under this patch. Now there are several geological reports in this area that show there's a major fault line through West Cumbria. The rock is not stable. It's known that it's not stable.

Here, 'galleries' refers to the horizontal underground tunnels or passageways within the coal mine's structure. David's concern centres on how these planned mine tunnels would extend beneath an area of contaminated marine sediment, creating potential risks of destabilisation or contamination. This testimony foregrounds the material agency of energy infrastructures and the land itself, evoking Jasanoff's (2004) concept of sociotechnical imaginaries, where state and industry narratives about progress are often in tension with local knowledge and material realities. The 'fault line' and 'unstable rock' serve as metaphors for the fragility of such

sociotechnical assemblages, as well as the deep temporal uncertainties that accompany projects like coal mining and nuclear waste storage (Harvey & Knox, 2015). These concerns echo critiques by Landström and Kemp (2020), who argue that the material and historical specificities of places like Cumbria must be central to debates about technoscientific projects such as the GDF.

The South Lakes Action on Climate Change website similarly juxtaposes visual and textual narratives to contest state imaginaries that frame the proposed coal mine as an engine of economic progress. One particularly revealing blog post references a BBC response to local campaigners: ‘our audience doesn’t care how close the mine is to Sellafield’. Reportedly shared in an email exchange, this remark underscores how mainstream media can sideline or trivialise local anxieties around environmental and nuclear safety. Given the BBC’s public service mandate (Born, 2004; Philo and Happer, 2013), such a stance raises questions about which voices are deemed legitimate in energy debates and which concerns are dismissed. From a critical media perspective, this marginalisation exemplifies entrenched power asymmetries (Curran, 2002; Carpentier, 2011). By determining what is newsworthy, public broadcasters shape dominant narratives, often privileging economic development over community well-being (Philo and Happer, 2013).

Beyond media neglect, David also expresses scepticism about environmental groups that avoid linking the coal mine to nuclear concerns:

Yes but all the people who’ve come onto the, joined the bandwagon if you like.  
Cos the group I belong to has been protesting since 2017 when they first applied  
for the licences for the mine and it’s not talked about. We just can’t—, even  
Greenpeace won’t talk about the nuclear connection.

His reference to a bandwagon suggests frustration with what he perceives as opportunistic late-stage activism, highlighting internal tensions within environmental movements between long-term campaigners and newer participants. This critique resonates with broader debates on environmental justice, where struggles over legitimacy and representation shape activism (Heffron and McCauley, 2017).

David's account reinforces the argument that energy infrastructures are not merely technological systems but deeply entangled with social and environmental histories. His testimony highlights the endurance of memory in shaping resistance and the uneven visibility of risk, shaped by political, economic, and media institutions. The case of Sellafield exemplifies how past and present energy projects intersect, creating an ongoing struggle for recognition and accountability. Through his narrative, we see how historical memory is harnessed to challenge the sociotechnical imaginaries that government and industry often promote, underscoring the continued fight for local agency in shaping energy futures. The cancellation of the coal mine may have marked a victory for environmental activists, but it has not erased broader concerns about Cumbria's infrastructural trajectory. The ongoing search for a site to host the Geological Disposal Facility (GDF) signals yet another chapter in the region's fraught relationship with high-risk energy infrastructures.

This tension between top-down and grassroots perspectives becomes even more evident when examining individual experiences with energy landscapes. My next participant, Dolores, whom I met in the Facebook group of Morecambe Extinction Rebellion during the lockdown, agreed to take part in my research. Her engagement with environmental activism began in her late teens, shaped by formative experiences in school and family discussions. A friend organised an Amnesty International film night featuring a documentary on the climate crisis, and around the

same time she watched *Cowspiracy*, which influenced her decision to become vegetarian.

Reflecting on this formative period, she explained:

I was already interested in politics and things like that, I did Politics AS Level.

And then I really remember, she showed... we did a film night and she did a film

and I can't remember the name of the film but it was an environmental film kind

of about the kind of crisis and what was coming. And I think since then I was

kind of very much kind of like thinking about it a lot... I think in my late teens

was when I started to really be like, oh I really care about this, kind of thing.

Although she attended protests and Extinction Rebellion (XR) events while at university, her involvement deepened when she returned home to Morecambe and joined the local XR group and the 'Wombling Wombles' litter-picking initiative. It was during this period that she began reflecting more actively on the interplay between landscape, infrastructure, and industrial heritage. For Dolores, living in Morecambe meant constantly encountering the stark juxtaposition between natural beauty and heavy industry. She described walking her dog near Heysham nuclear power station, just miles from the proposed Eden Project North, and how the proximity of these sites unsettled her:

We do dog walks. Me and my mum go for dog walks at the nature reserve that they've got next to the nuclear site. We do that a lot, and I always just find it bizarre because you've got this thing that like just seems so kind of brutal in the big cubes that there are, that make it up, next to this nature reserve which is very lovely. And also then the Bay itself which is so beautiful and you can see the mountains in the Lake District and you have all that beautiful kind of natural landscape around you that is supposed to be, you know, one of the richest

wildlife sites in the UK, but I dunno, it always feels weird to me that it's right next to something that is so dangerous and polluting.

Her work in Cumbria reinforced this sense of dissonance. Although she worked remotely, her job involved collaborating with young people from the region, many of whom had close family ties to Sellafield. She noted how their feelings echoed her own:

My colleagues there also say the same thing, that you're kind of, it's this weird thing that next to places that are so beautiful and kind of like natural even though they've been cultivated and stuff, yeah having these huge big sites next to this is such a weird thing to have and kind of really quite sad in some ways.

Returning home from university also meant re-encountering the industrial past embedded in the Northern landscape. She described a particular moment of recognition while travelling by train from the South:

When I used to come home from university... especially going over to see my grandparents who both lived in Yorkshire, all of a sudden seeing like old mills and old factories and coal mines and stuff pop up as you go down through the trainline, always made me be like, ah we're entering the North.

When I told Dolores about my research, she expressed an interest in reading some of the Cotton Famine poems. She was struck by the ways in which historical industrial transitions echoed contemporary energy debates. In particular, she reflected on *The Smokeless Chimney*, which resonated with her experience of travelling through the North and witnessing industrial landmarks emerge:

When I read it I was like, oh yeah I really know that about like literally on the Northern railway and I was like, oh my God that's literally what me and my

friends talk about... about the fact that when you go, when you come home from the South, you just immediately start seeing like factories just pop up.

While she recognised the hardships endured by past industrial workers, she also acknowledged how deeply industry was woven into Northern identity:

Cos on the one hand I'm like, oh I don't know if I agree with that because, you know, the conditions that they were working in were so horrendous, but at the same time I really, I don't know, it's the thing I really love about Northern identity, that we have this kind of industry. And also that we have these buildings there cos I think it really connects us to our past as like people, you know because you can't help but go around, and it makes me so sad now.

For Dolores, the gentrification of former industrial sites signalled a disconnect between past and present. She recounted how a historic mill in Clitheroe had been transformed into a high-end retail space:

There was a really old mill that was just an abandoned mill called Holmes Mill and that has now been changed and made into a very upmarket like brewery and they've got like a farm shop and they've got a cinema and they've made it into a whole like kind of retail complex... They at first were like, oh we're renovating the mill and then now they've just fully knocked down the mill and it's not there anymore.

This erasure of industrial memory, she suggested, paralleled contemporary debates about energy transition. The push for net-zero policies and the development of low-carbon industries often overlooked the social dimensions of economic transformation. For Dolores, such erasures risk repeating historical patterns, where shifts in industrial regimes failed to reckon with their wider

human consequences. She pointed to past transitions, such as the Lancashire Cotton Famine, to illustrate how industrial shifts had long been entangled with global economic forces, class struggle, and moral dilemmas:

It's an industry that means so much to these people but actually is still based, not only in terms of burning fossil fuels and scarring the landscape or whatever, but also on the enslaved labour of so many people in America as well.

The connections Dolores drew between historical industrial transitions and current energy debates resonate with discussions at the Geological Disposal Facility (GDF) research event I attended which I analyse in the following section. Both contexts raise fundamental questions about economic dependency, industrial legacies, and long-term sustainability. Just as the Cotton Famine poetry documented anxieties about shifting energy regimes and labour precarity in the nineteenth century, contemporary debates over nuclear waste disposal and coal mining in Cumbria grapple with unresolved tensions between economic growth, environmental risk, and local agency.

At the GDF event, policymakers and executives framed nuclear waste disposal as an exercise in long-term responsibility, invoking deep-time imaginaries to present the burial of hazardous materials as both rational and necessary. Economic arguments were central: the project was positioned as a source of investment and development for potential host communities, with financial incentives explicitly tied to the scale of excavation. A parallel logic was evident in the case for the proposed coal mine in Cumbria, where job creation was repeatedly invoked as justification, even though critics questioned whether such benefits would be either secure or enduring. Against this backdrop, Dolores' critique of dependence on single-industry economies— 'you're still fuelling the idea that you've got whole towns that are reliant on one industry and if that one industry fails or goes under, that's a whole town gone'—highlights the

fragility embedded in such promises. Her reflection exposes the risks of equating economic development with infrastructural expansion, underscoring how community sustainability cannot be reduced to short-term financial gain. Her reflections also echoed broader anxieties about the uncertainties of industrial transformation. At the GDF event, speakers raised the problem of intergenerational equity, asking whose futures are prioritised when making decisions about high-risk energy systems. Dolores, too, wrestled with this dilemma, acknowledging that while energy transition is necessary, it remains fraught with contradictions:

I think that oftentimes... if we get rid of some of the industries—I mean not so much in this country any more—but in the way that we rely on certain industries and we rely on fossil fuels, how exactly is that going to work and how is that going to affect normal people?

Through her engagement with Cotton Famine poetry, her lived experience in Cumbria, and her environmental activism, Dolores illustrates how artistic and historical narratives provide critical context for understanding contemporary struggles over energy infrastructures. Her perspective highlights the ongoing negotiations between economic survival, environmental responsibility, and industrial memory. Crucially, juxtaposing her testimony with the institutional framings of the GDF event demonstrates the value of a transdisciplinary approach: one that places community voices, historical imaginaries, and policy discourses into conversation, revealing the persistent frictions between top-down visions of progress and the lived realities of energy transition.

**Institutional Stagings of Nuclear Futures: Policy Ethnography and Industrial Fieldwork**

This section extends the focus from grassroots perspectives (as seen in David's and Dolores's testimonies) to institutional framings of nuclear futures. As part of my institutional and policy ethnography, I attended a research event in March 2022 at the University of Manchester, organised by the Nuclear Waste Services Research Support Office. Titled '*Topic Day on Social Science Research for a Geological Disposal Facility*', the event convened a GDF executive, policymakers, environmental and social scientists, and humanities academics. My aim in attending was to observe how knowledge is produced, communicated, and legitimised in institutional settings, and to analyse the discursive strategies used to frame nuclear waste disposal as a viable, long-term infrastructure project. I documented my observations through fieldnotes, positioning myself as both an observer and an embedded participant within the unfolding discourse.

This methodological transition reflects the transdisciplinary orientation of the thesis. As Pohl and Hirsch Hadorn (2007) and Lang et al. (2012) emphasise, transdisciplinarity integrates academic inquiry with practitioner and community expertise in order to address real-world problems. By juxtaposing dramaturgical readings (Chapter 2), activist testimonies (David, Dolores), and institutional ethnography, this chapter situates nuclear imaginaries at the interface of cultural, social, and policy domains. Following MacLeod and Nagatsu's (2018) call for 'problem-oriented' inquiry, the GDF event is treated not as a discrete policy meeting but as a performance in which sociotechnical imaginaries are staged, contested, and normalised. This reflexive positioning also marks my own autoethnographic stance: not only analysing institutional discourse but also reflecting on how my presence as a researcher shaped my perception of nuclear governance as a cultural and political practice.

The GDF executive's presentation framed the project as a responsible solution for nuclear waste management, emphasising three recurrent principles: transparency, safety, and the future. These

are emblematic of what Jasanoff and Kim (2009) describe as sociotechnical imaginaries—shared visions that justify high-risk technological projects by embedding them within narratives of national progress, environmental stewardship, and intergenerational responsibility. The executive identified Copeland and Allerdale as ‘suitable sites with willing communities,’ signalling early-stage consent-building. Policy stipulates that GDF cannot approach communities directly, but must wait for expressions of interest, which are then channelled through the Secretary of State. This ‘voluntarism’ was presented as a safeguard of inclusivity; yet, from a policy ethnography perspective (Shore & Wright, 1997), it raises questions about how participation is structured and whose voices ultimately shape decision-making.

A revealing moment came with the project’s motto: ‘The more they dig, the more money they give. This slogan exemplifies how economic incentives are woven into nuclear infrastructure debates, recasting disposal not as a burden but as an opportunity. Such discursive strategies resonate with Dorothy Smith’s (2005) *institutional ethnography*, which highlights how official narratives are designed to normalise contested infrastructures by embedding them in the language of development and prosperity.

Equally striking was the executive’s reliance on deep-time imaginaries, comparing nuclear copper deposits to Mesozoic-era copper formations. By aligning nuclear disposal with geological time, the discourse sought to reassure publics that disposal strategies could be rendered technically and temporally secure. This ‘deep-time framing’ reflects broader debates in STS (Jasanoff, 2004) about how institutions communicate risk across scales far beyond human lifespans.

Yet exclusions were also telling. The Lake District National Park was highlighted as off-limits, an example of strategic boundary-making that delineates ‘acceptable’ versus ‘unacceptable’ sites. From a critical perspective, this boundary-making sidesteps the anxieties of communities

already proximate to Sellafield, effectively bracketing out lived experience in favour of procedural legitimacy.

Connecting this event back to David's testimony, parallels emerge: his frustration at media silence and political complicity mirrors how institutions frame and manage risk by controlling visibility. His insistence that 'the world's against it' stands in stark contrast to institutional narratives of 'willing communities.' Both illustrate the tensions between top-down policy imaginaries and grassroots resistance.

In this sense, the GDF event exemplifies the performativity of policy. Policies are not only written but enacted and legitimised in events like these, where language, symbolism, and procedural assurances play as important a role as technical detail. As Bickerstaff (2022) notes, nuclear governance often relies on carefully choreographed framings that obscure uncertainties while projecting authority.

For this thesis, attending the GDF event was therefore not simply data collection but a transdisciplinary intervention: situating theatre and activist testimony alongside institutional discourse. This triangulation demonstrates how energy imaginaries are co-produced across cultural, activist, and policy domains, and underscores the value of combining dramaturgical analysis, ethnographic immersion, and critical policy analysis in the environmental humanities.

The sociotechnical imaginaries that frame nuclear power are constructed through narratives emphasising safety, productivity, and progress. These imaginaries often align with broader goals of low-carbon energy futures and climate change mitigation. Yet, as my participants reveal, such narratives evoke suspicion, uncertainty, and ambivalence among those living near nuclear infrastructures. The tension between state-sponsored optimism and lived experiences

highlights critical gaps in communication, participation, and trust (Longhurst and Chilvers, 2019).

To examine how these imaginaries are actively constructed and maintained, I undertook participant observation during a guided tour of Heysham 2 Power Station on 23 June 2022, accompanied by colleagues from my PhD cohort. The tour offered firsthand insight into how the nuclear industry curates public narratives that reinforce legitimacy, safety, and economic value. As Timothy Mitchell (2011) argues, infrastructure is not only material but also epistemological, producing ways of seeing and knowing energy systems. The Heysham tour exemplified this logic: a choreographed performance designed to domesticate risk and present nuclear power as both ordinary and indispensable.

Sheila Jasanoff and Sang-Hyun Kim's (2013) concept of sociotechnical imaginaries helps illuminate this framing. State and industry narratives typically foreground technological benefits while downplaying risks as limited and manageable. This was evident at Heysham, where communications staff emphasised rigorous safety protocols, technical expertise, and the plant's integration into community life. Workers described their relationship with the plant as reciprocal: they cared for it, and it cared for them. This mirrors Cara Daggett's (2019) analysis of nuclear labour, where productivity is valorised and work becomes a source of identity and pride. The guides' narratives emphasised the plant's integration into the local community, highlighting employee satisfaction and the mutual benefits of this relationship. However, this framing actively depoliticises the broader ethical and environmental stakes of nuclear power. As Daggett (2019) observes, nuclear labour is cast within a linear equation: energy equates to work, work to productivity, and productivity to progress. Such a formulation masks the risks, uncertainties, and ethical dilemmas embedded in nuclear materialities. Throughout this thesis, I have argued that energy infrastructures are not merely technical systems but are embedded within sociotechnical imaginaries that shape cultural and political discourses. Larkin (2013)

similarly highlights how infrastructures generate ‘sensorial and political experiences,’ staging their own necessity through spectacle, repetition, and routine.

At Heysham, this was evident in the carefully choreographed movements of bodies through corridors, the scripted narration of control rooms, and the visual sequencing of safety signage, all of which fold risk into procedural normalcy. Read as ‘policy performance’ (Shore & Wright, 1997), the tour functions less as an invitation to deliberation than as an enactment of consensus, presenting safety, productivity, and community benefit as settled facts rather than open questions. In STS terms, this is a classic sociotechnical imaginary (Jasanoff & Kim, 2009): a vision of clean, reliable energy secured by expertise, in which hazards are simultaneously made visible (through monitors, protocols, and warning signs) and rendered contained (bounded, measured, controlled).

This curatorial logic also helps explain the ambivalence of local responses. The Heysham tour actively domesticates risk by scripting how it should be seen, sensed, and morally weighed. When confronted with the contentious issue of radioactivity, guides sought to naturalise it: one recounted that her husband, a long-time plant employee, had consistently lower levels of radioactivity in his body than the permissible public threshold. Such anecdotes align with strategies identified by Bickerstaff et al. (2008), where radioactivity is reframed as both ordinary and manageable. By emphasising its natural occurrence and downplaying its risks within the plant, the tour neutralises nuclear anxieties, embedding them within a sociotechnical imaginary that equates safety with expertise and trust in institutional protocols.

The Heysham plant tour exemplified how nuclear risk is rendered ordinary through institutional performance. As Parkhill et al. (2009) note, communities living near nuclear facilities often negotiate a dual relationship with risk: it becomes woven into everyday routines yet remains capable of provoking moments of acute anxiety. The tour sought to stabilise this tension by

highlighting the plant's 'exceptional' safety record and its close ties to the local community. I argue that such framing produces what can be understood as a *staged consensus*: participation is orchestrated so that it appears as tacit agreement with institutional narratives, rather than opening a space for dissent or for the articulation of alternative imaginaries. The framing of safety and consensus at Heysham exemplifies how nuclear infrastructures are rendered ordinary. As Jasanoff (2015) observes, nuclear imaginaries rely on the presumption that risk is manageable, calculable, and ultimately controllable through expertise.

Institutional narratives are designed to stabilise this tension. Longhurst and Chilvers (2019) argue that centralised energy systems such as nuclear perpetuate technocratic authority by narrowing the terms of public participation, offering consultation without meaningful redistribution of power. Blowers (2016) makes a similar point in relation to the siting of the Geological Disposal Facility (GDF), where community 'partnerships' often act less as sites of genuine dialogue than as post-political devices to contain opposition and secure legitimacy.

This work of stabilisation extends to the materials themselves. Hecht (2012) shows how nuclear matter is routinely normalised, folded into narratives of technical competence that erase its contested history and uncertain futures. Sze (2020) stresses how this displacement has uneven social effects: communities most exposed to risk are also those most excluded from governance. My own fieldwork reflects this contradiction. At Heysham, safety was presented as a settled fact; at Sellafield, by contrast, participants described an ambivalent attachment, pride in regional identity entwined with unease about contamination and legacy waste.

These contrasting accounts demonstrate that nuclear infrastructures are not only technological systems but also cultural projects. They anchor visions of collective futures in which expertise ensures progress, productivity stands for prosperity, and hazards are presented as visible yet securely contained. In this sense, the Heysham tour was not simply informational: it was a

mechanism for shaping how risk should be seen, sensed, and weighed. By reading it ethnographically, we can trace how the extraordinary becomes ordinary, how uncertainty is reframed as assurance, and how energy futures are naturalised as inevitable.

These insights reinforce the thesis's central argument: that nuclear infrastructures are shaped not only by material realities but also by carefully curated narratives that structure public perceptions, mediate risk, and define the possibilities for democratic engagement with energy futures.

### *Cumbrian Alchemy*: Integrating Energy Infrastructures, Deep Time, And Affect

These themes also surface in artistic projects that attend to the material and cultural landscapes of the region, such as *Cumbrian Alchemy* (2013), an essay anthology by Professor Robert Williams and artist Bryan McGovern Wilson. Blending archaeology, photography, nuclear engineering, and folklore traditions, the project explores the layered histories and speculative futures embedded in Cumbria's terrain. Following my methodological framework, I conducted a semi-structured interview with Robert Williams, a Lancaster-based artist, where we discussed the origins of the project and how the artists integrated art and science to create a dialogue between these seemingly disparate fields. The *Cumbrian Alchemy* project offers an interdisciplinary lens to interrogate the entanglements of energy infrastructures, materiality, temporality, and cultural memory in the Northwest of England. This effort aligns with

scholarship that emphasises the need to transcend narrow technical and policy-focused narratives of energy systems, situating them instead within broader social, cultural, and affective contexts (Boyer, 2019; Hecht, 2012; Morton, 2013). Although distinct from policy discourse or resident testimony, this project functions as a cultural interlocutor, mediating between institutional imaginaries of deep time and the affective dimensions of nuclear permanence.

Robert Williams's framing of *Cumbrian Alchemy* as a 'collision' of archaeological monuments, folklore traditions, and nuclear infrastructures and highlights the layered spatial and temporal dimensions of the region's Energy Coast. Williams's reflections on the tangibility and intangibility of radioactive material reinforce ideas explored earlier in this chapter. As he notes, radioactivity is never directly perceived but always mediated - through shielding, instruments, or symbolic representations. This echoes my earlier discussion of Timothy Morton's (2013) hyperobjects, where nuclear materiality exists on scales so vast that it resists direct human apprehension. These insights build on previous arguments about the way nuclear infrastructures disrupt conventional sensory and epistemological frameworks, complicating the simplistic dichotomies of nuclear power as either a technological marvel or an existential threat.

Similarly, *Cumbrian Alchemy* revisits the theme of 'nuclearity' as both a cultural and material phenomenon, extending my earlier engagement with Gabrielle Hecht's (2012) work. Just as previous sections examined how nuclear infrastructures are framed through binaries of risk and salvation, Williams's project actively destabilizes these categories. By integrating nuclear science with folklore, *Cumbrian Alchemy* positions energy infrastructures as artefacts of deep time, much like the Geological Disposal Facility discourse discussed earlier. The project's invocation of Norse mythology and regional storytelling traditions reflects a broader pattern of nuclear sites being interpreted not just as industrial hazards but as sites of historical and ontological significance (Barrowclough, 2019). This layered approach strengthens the

argument that nuclear infrastructures are not merely technological objects but complex cultural signifiers embedded in the Cumbrian landscape. Barrowclough's essay in the anthology underscores this intersection by drawing attention to the dissonance between the short-term events that create radioactive residue and the long-term temporalities of its decay. This tension mirrors broader anxieties around intergenerational equity and environmental justice, particularly regarding the ethical implications of waste disposal (Blowers, 2016). Participant narratives often reflect similar concerns, with many expressing unease about how current nuclear policies defer accountability into the future while framing the future as a site of resolution and safety. The artistic interventions in *Cumbrian Alchemy* further enrich this discourse by emphasising the affective and symbolic dimensions of nuclear and energy infrastructures. Williams and McGovern Wilson's use of artefacts, oral traditions, and visual media explores the intersections of materiality and narrative, revealing how infrastructures like Sellafield operate as both physical sites and conceptual spaces. As Jane Bennett (2010) argues, materials have agentic capacities that shape human experiences and social systems, a theme that the project foregrounds through its engagement with the aesthetic and symbolic power of energy sites.

The artists' reflections on the future of nuclear materials also resonate with broader discussions about the temporality of energy infrastructures. Williams's observation that radioactive materials will outlive human civilizations underscores the challenges of communicating risk across millennia, a theme also explored in nuclear semiotics and deep time archaeology (Holtorf & Högberg, 2014). This notion of materials carrying narratives beyond human existence invites a rethinking of agency and accountability, positioning energy infrastructures as participants in an ongoing and open-ended story. By departing from the sensationalist and banalized discourses that often characterize nuclear aesthetics, *Cumbrian*

*Alchemy* offers a critical intervention into how nuclear power is represented and remembered. Hecht (2012) critiques the ‘banalisation’ of ‘nuclearity,’ where its dangers are normalised or sensationalised, limiting the scope for meaningful engagement. Similarly, Bickerstaff (2022) emphasises the need to foreground everyday experiences and slow violence in discussions about nuclear risk. *Cumbrian Alchemy* responds to these critiques by destabilising the dualities of nuclear exceptionalism and revealing the multiplicity of ways nuclear materialities intersect with local histories, affective attachments, and cultural practices.

McGovern Wilson’s reflections on the aesthetics of the project further reinforce this point. By focusing on the ‘cycles of renewal’ and the mystical dimensions of energy, the project challenges conventional narratives of progress and innovation, instead presenting energy infrastructures as sites of rupture and continuity. This perspective aligns with Elizabeth Shove’s (2003) analysis of sociotechnical change, which highlights the interconnectedness of material, cultural, and institutional practices in shaping energy transitions. A significant aspect of this research investigates alternative sociotechnical imaginaries, particularly those offering more nuanced perspectives on the complexities of living in proximity to energy infrastructures. These imaginaries inform the ways in which individuals and communities conceptualise, engage with, and respond to the presence of such infrastructures.

Ele Carpenter, in *Nuclear Culture* (2016), underscores the transformative potential of interdisciplinary collaborations between industry, research, and the arts. She observes that ‘industry/research or art/science partnerships often have expectations that art might articulate what is already visible and known, whilst artists might interrogate the interplay of visibility and invisibility both materially and politically in unexpected ways’ (Carpenter, 2016). This insight highlights the unique capacity of artistic practices to transcend conventional representational frameworks. By probing the less perceptible facets of energy systems, both their material and

political dimensions, artists and communities can challenge dominant narratives that depict these infrastructures solely through a technical or economic lens.

When I interviewed Roberts Williams about how he perceives the connection between the energy coast and the archaeological heritage of Lancashire and Cumbria, he referred to these as ‘places of power,’ specifically contrasting sites like Lancaster Castle, traditionally tied to military power, with areas such as Drigg, where a radioactive waste repository is located. Reflecting on radioactivity and its interplay between the visible and invisible, Robert noted that such liminal qualities invite deeper exploration of how communities experience and make sense of energy production’s latent effects. His observations underscore the importance of examining not only the tangible manifestations of energy systems but also the social, cultural, and emotional dimensions that may be less immediately apparent but are no less influential in shaping local imaginaries and responses:

Well it [is] tangible and it isn’t. I think what makes the material so interesting from a cultural point of view, because it does have a materiality, it’s just that you can’t encounter it directly, you have to encounter it indirectly. Whether in a power station behind glass with protective things or simply shielded in some way.

His observation underscores how nuclear substances exist at the limits of sensory perception, reinforcing the ways in which scientific and mythic narratives alike mediate human engagement with the invisible forces that shape the region. The project shows how each energy modality intersects with scientific, cultural, and folkloric domains, creating a sense of continuity among distinct modes of inquiry. It juxtaposes the scientific discourse surrounding nuclear energy, particularly the principles of radioactivity, with Norse myths and local folklore traditions that occupy the ‘mythic spaces’ of the Cumbrian ‘Energy Coast’. By doing so, *Cumbrian Alchemy* ‘speaks to the alchemical imagination, of the Microcosm and the

Macrocosm, how the very, very small is very often analogous to the very, very large, and what this might mean in terms of power, actual, metaphoric or occult' (Williams and McGovern, p. 9). By framing nuclear infrastructures through both scientific and esoteric lenses, it highlights the tensions between visibility and obscurity, materiality and intangibility, past and future tensions that shape both the region's cultural memory and contemporary energy debates.

During my interview with Robert Williams, he echoed sentiments shared by many participants about the anxieties surrounding nuclear energy. When asked how radioactivity relates to risk, he remarked, 'I mean personally I'm utterly terrified, absolutely terrified of radioactivity, yeah.' Reflecting on the future of nuclear materials, he stresses the unavoidable permanence of radioactivity, suggesting that neither technological remedies nor cultural narratives can fully dispel its enduring effects. He continues:

It's here to stay, the material's here to stay so something has to happen to it and that something of course is going to be Deep Time geological repositories. There's no other possibility. You can't launch it into space because of the dangers of the thing going up on the launch pad with a massive dirty bomb. (...) I mean most of the world's plutonium is sitting in Sellafield and it's unbelievably dangerous material. So and you know frankly I'd rather that was put under the ground for a long time rather than in the nose cone of a cruise missile, you know [laughs].

Robert Williams's reflection on the inescapable permanence of radioactive material, 'It's here to stay' underscores an unsettling dynamic that Joseph Masco (2006) has termed the 'nuclear uncanny.' In *The Nuclear Borderlands: The Manhattan Project in Post-Cold War New Mexico*, Masco describes how nuclear technologies blur the line between everyday normalcy and existential hazard, intertwining routine social life with incomprehensible timescales and invisible dangers. Williams's remarks similarly point to the disquieting fact that nuclear waste,

once produced, must be managed for millennia, placing intergenerational burdens on communities and infrastructures. By stressing the enduring risk posed by stored plutonium, Williams highlights how nuclear materials can never be fully separated from the social and ecological worlds they inhabit. These substances fuse distant geological strata, present-day anxieties, and speculative futures. His preference for geological burial over more militaristic endpoints reflects the deep ethical dilemmas that arise when handling what some have termed ‘haunted objects’ (Pitkanen and Farish, 2013), which remain active agents in both cultural and environmental realms far beyond human lifespans.

Building on these insights from my conversation with Williams, I now turn to an examination of *Cumbrian Alchemy* itself. In his contribution to the project, Barrowclough illustrates this temporal layering by highlighting that ‘the radioactive residue that lasts 100,000 years arises out of the short-term event of detonating a bomb or activating a power station.’ This juxtaposition of the fleeting and the enduring recalls earlier discussions in this thesis about how historical memory continues to shape perceptions of energy infrastructures: from the Cotton Famine poetry’s record of fossil-fuelled industrial transitions to David’s testimony about Sellafield and the long shadow of Millom’s collapsed mine. Placed alongside recent discussions at a Geological Disposal Facility (GDF) topic day, Barrowclough’s reflection underscores the profound challenge of communicating nuclear risks across radically different temporal horizons. Radioactive waste management demands not only scientific and technical assessment but also cultural, historical, and imaginative resources to translate what ‘100,000 years’ might mean in lived experience. This movement between artistic practice, archaeological perspective, and institutional discourse exemplifies the transdisciplinary challenge of nuclear governance: no single framework—scientific, cultural, or political—can adequately account for the entangled scales at play. Instead, it is in the dialogue between these different registers of expertise and imagination that the complexities of radioactive futures become most visible.

Projects like the *Cumbrian Alchemy* attend to this future oriented dilemma by exploring the long-term implications of energy materials. In the book's final section, Williams and Bryan McGovern Wilson describe how they integrate artefacts, oral traditions, monuments, and scientific research, uniting multiple elements that coexist in the northwest region. Their aim is to trace 'a lineage of symbols, a lineage of time and specifically how that can be mediated by contemporary issues' (McGovern Wilson, p. 78). This approach shows how objects and spaces fold onto each other, and how human actors inhabit, interpret, or operate them.

Discussing meaning-making, McGovern Wilson underscores the 'potency' of materials and infrastructures (theme that aligns with the thesis at hand) by stressing their agentic and affective capacities to move both individuals and communities. He notes that these narratives 'exist beyond ourselves,' citing the enduring nature of monuments of deep time and nuclear repositories that continue to be shaped by stories long after our direct involvement ends. 'There is in some way a narrative at play, a fluid narrative, a narrative that is going on without you, but if you want to enter into it there are points of entry, tributaries, to enter into the flow of the narrative' (p. 79). By situating today's nuclear practices within their immense temporal frames, *Cumbrian Alchemy* reveals how the 'nuclear uncanny,' this disquieting mix of familiarity and existential dread, demands new ways of thinking about risk, responsibility, and communication that extend well beyond the present moment. The *Cumbrian Alchemy* underscores how nuclear infrastructures, positioned at the nexus of cultural memory, myth, and deep time, transcend purely technical or economic definitions. The project troubles simplistic binaries of nuclear 'exceptionalism' and nuclear 'banalisation,' revealing instead how the built environment, social imaginaries, and regional identities interweave around such sites. Yet these artistic explorations also connect to more tangible, everyday engagements with nuclear power, including how plant operators manage public perceptions of safety and community integration. It is within this broader context that Heysham Power Station becomes a critical point of comparison. Where

*Cumbrian Alchemy* unsettles nuclear imaginaries by layering myth, folklore, and affect onto infrastructures, Heysham's official tours work in the opposite direction, seeking to stabilise those imaginaries through institutional performance that frames nuclear power as routine, safe, and indispensable. This shift, from an artistic project that foregrounds deep-time risks to an industry-curated tour that domesticates them, illustrates how competing modes of knowledge-making shape public understandings of nuclear energy. Both interventions operate within the same socio-technical landscape, yet they mobilise markedly different strategies: one exposes uncertainty and cultural memory, while the other normalises risk through carefully choreographed displays of control and competence.

## Conclusion

This chapter examined how nuclear infrastructures in Northwest England operate not only as technical systems but also as cultural and political terrains where imaginaries of safety, risk, and progress are produced, contested, and lived. By drawing together ethnographic testimony, artistic interventions, and policy performances, I have shown how nuclear power is experienced across different registers: as institutional narrative, as personal memory, and as cultural symbol.

The accounts of interlocutors such as David and Dolores foreground the affective and ethical dimensions of living with nuclear infrastructures. Their reflections reveal how historical legacies, such as the Windscale fire or the industrial past inscribed in the Northern landscape, persist as cultural memory and continue to shape contemporary imaginaries of risk and identity. At the same time, institutional performances—such as the Geological Disposal Facility research event and the guided tour of Heysham 2, demonstrate how official discourses curate consensus, framing nuclear power as safe, productive, and essential to a low-carbon future. These policy

narratives attempt to domesticate risk by naturalising radioactivity, embedding economic incentives, and positioning nuclear technologies as inevitable.

Projects such as *Cumbrian Alchemy* further highlight how nuclear infrastructures exceed their technical definitions, entering domains of folklore, deep time, and myth. By juxtaposing scientific discourse with local traditions and artistic practices, the project underscores the multiplicity of ways in which radioactive materials are made meaningful—whether as haunted presences, ‘hyperobjects’, or cultural artefacts of endurance. In doing so, it extends Gabrielle Hecht’s notion of ‘nuclearity’ and demonstrates how nuclear sites act as both industrial hazards and symbolic touchstones within the Cumbrian landscape.

Nuclear infrastructures anchor communities in long temporal horizons, binding them to ecological and ethical obligations that outlast individual lifespans. They also expose the tension between institutional attempts to stabilise sociotechnical imaginaries and community experiences that reanimate memories of risk and contest the allocation of responsibility.

By foregrounding the interplay between institutional and personal accounts, this chapter has demonstrated that nuclear transitions cannot be reduced to technical or economic matters. They are lived, narrated, and symbolically mediated, generating complex attachments that span deep time and everyday life. Energy infrastructures emerge here as contested terrains where competing visions of the future are staged, from state promises of safety and prosperity to community anxieties about contamination and decline.

This analysis contributes to the thesis by reinforcing the central claim that energy transitions are cultural and ethical as much as technological. It underscores the need for not only interdisciplinary but transdisciplinary approaches that bring different kinds of knowledge into sustained dialogue. While interdisciplinarity typically conjoins distinct academic fields, transdisciplinarity extends this further by integrating practitioner, community, and artistic

perspectives into the production of knowledge (Pohl & Hirsch Hadorn, 2007; Lang et al., 2012).

In the context of nuclear futures, this means that memory, affect, and symbolic meaning cannot be treated as secondary to governance and materiality; rather, they form part of the lived ecologies through which infrastructures are understood, contested, and endured. By drawing together ethnographic testimony, artistic practice, institutional performance, and theoretical analysis, this chapter demonstrates how transdisciplinary methods can surface the contradictions and ambivalences often obscured by technocratic framings of risk and safety.

As the thesis moves toward its conclusion, the insights from this chapter fold back into the broader argument that thermodynamic ethics provide a throughline connecting past industrial imaginaries with contemporary nuclear futures. This perspective makes clear that the pursuit of progress is never a purely technical endeavour but always entangled with cultural values, historical legacies, and contested visions of justice. In this sense, transdisciplinarity is not only a methodological orientation but also an ethical stance: one that insists on attending to multiple registers of knowledge (scientific, cultural, experiential) when grappling with infrastructures that shape lives and landscapes across deep time.

## Conclusion

### Radiating Futures: Narratives, Materialities and the Ethics of Energy Transitions

This thesis has explored how energy infrastructures are not simply technical artefacts but cultural, political, and ethical sites where historical legacies and contemporary struggles converge. Beginning with the Cotton Famine in the Northwest of England and extending to present debates around coal extraction and nuclear waste disposal, I have argued that energy transitions must be understood as cultural processes, shaped by narrative, imagination, and lived experience as much as by technological or economic calculation.

In the Introduction, I asked how cultural narratives, historical memory, and everyday practices shape responses to energy systems in transition. Each chapter has demonstrated that these questions cannot be separated: the legacy of industrial crises such as the Cotton Famine continues to structure how communities interpret new proposals; contemporary cultural forms

such as theatre and visual art actively intervene in energy debates; and ethnographic encounters reveal how residents negotiate the ambivalence of infrastructures that promise prosperity while generating anxiety and precarity. In bringing these perspectives together, I have contributed in developing the concept of thermodynamic ethics to describe the cultural and moral logics through which energy infrastructures are legitimised, resisted, and reimagined.

A first contribution of this research is its historical genealogy. By situating present struggles in relation to the Cotton Famine, I showed how resource crises recur as moments of cultural production, where poetry, pamphlets, and later plays articulate both resilience and critique. This continuity underscores that transitions are never purely technical but always contested and narrated. A second contribution lies in the ethnographic and creative analysis of contemporary Cumbria and Lancashire. Interviews, participant observation, and digital ethnography revealed how residents negotiate the burdens and promises of coal and nuclear proposals, while collaborations with playwrights and community artists demonstrated how cultural production shapes imaginaries of energy futures. These materials show that storytelling is not peripheral but constitutive of energy transitions. Finally, the theoretical contribution of thermodynamic ethics extends critical energy studies by foregrounding the ethical, affective, and temporal dimensions of infrastructures. It highlights how transitions are framed through moralised narratives of efficiency, productivity, and progress, and how communities resist these framings by invoking alternative temporalities and values.

This thesis has also illuminated the temporal politics of energy. Coal proposals evoke nostalgia for industrial prosperity, while nuclear waste management forces communities to confront deep-time responsibilities that far exceed ordinary political horizons. By examining how infrastructures operate as devices of temporal imagination, I have shown how energy systems

organise not only labour and resources but also memory, anticipation, and intergenerational obligation.

The limitations of this research reflect choices of focus. A concentration on coal and nuclear infrastructures in North Lancashire and Cumbria inevitably leaves out other geographies and renewable systems that might generate different imaginaries. Pandemic constraints also meant that some embodied, place-based ethnography had to be adapted to online methods. These constraints do not diminish the value of the findings but highlight opportunities for future work, particularly comparative research across the global South, where energy inequalities are sharper, and closer analysis of renewable infrastructures and their justice dimensions.

The implications of this study extend beyond academic debates. Understanding energy infrastructures as cultural and ethical formations challenges policy frameworks that privilege technical fixes and economic rationales. Integrating cultural narratives and community voices into transition planning could produce more just and sustainable outcomes. Future research might extend the framework of thermodynamic ethics into collaborations between policymakers, artists, and communities, exploring how cultural practices can open new pathways for equitable transition.

### Key Contributions: Cultural Interventions and Contested Infrastructures

A central contribution of this thesis lies in demonstrating how cultural production and contested infrastructures jointly shape the imaginaries of energy transitions. By engaging directly with regional playwrights and productions such as *Ergon: The Wicked Problem*, *North Country*, and *Keeping the Lights On*, I showed that theatre is not a passive reflection of social conditions but an active intervention in debates about energy, labour, and sustainability. These works echo the creative resistance of the Cotton Famine, underscoring that artistic practice has long functioned

as both critique and catalyst in moments of resource crisis. Through close readings and conversations with the playwrights themselves, I revealed how their creative decisions were informed by local histories, ethical dilemmas, and the pressures of living with ongoing economic precarity. This foregrounds the cultural imagination as a key driver in shaping how communities interpret energy futures. Situating these insights within the framework of thermodynamic ethics, I argued that the narratives embedded in performance actively contest the narrow logics of efficiency and productivity that dominate state and corporate visions of transition.

The analysis of infrastructures in limbo further strengthens this claim. The proposed coal mine in Cumbria and the geological disposal facility for nuclear waste exemplify how energy projects are rarely linear or settled; instead, they remain suspended in states of uncertainty, simultaneously promised, deferred, or resisted. These unsettled infrastructures reveal that energy transitions are never neat replacements of one system by another but layered, recursive processes marked by contestation. Coal carries the weight of nostalgia for industrial prosperity, while nuclear waste compels communities to grapple with obligations stretching into deep time. By examining how these infrastructures disrupt temporal expectations—between immediate economic needs and intergenerational responsibilities—I highlighted how communities navigate profound ethical dilemmas. Local resistance, from grassroots activism to cultural projects such as the *Cumbrian Alchemy*, demonstrates how alternative temporalities and imaginaries of justice are articulated in the very spaces where state-driven visions seek to impose linear progress.

Taken together, the theatrical interventions and contested infrastructures reinforce the wider argument of this thesis: that energy systems are co-constructed through narrative, performance, and everyday struggle, not simply through policy or technology. The plays I analysed and the

infrastructures I studied both show that energy debates unfold across imaginative as well as material terrains, where questions of labour, justice, and identity are negotiated alongside technical and economic considerations. By weaving together these cultural and material dimensions, I demonstrated that infrastructures function as cultural devices through which societies mediate not only resources but also memory, belonging, and visions of the future.

This dual focus makes two distinctive contributions to the field. First, it expands the scope of energy humanities by integrating performance analysis and ethnographic engagement with policy debates and infrastructure studies, offering a methodology that bridges textual, creative, and empirical approaches. Second, it develops the concept of thermodynamic ethics into a framework capable of addressing temporality, resistance, and imagination as constitutive features of energy transition. Rather than viewing culture as peripheral, this thesis establishes cultural production and community practice as central forces in shaping the ethics and politics of energy. In doing so, it provides a model for future interdisciplinary inquiry that recognises the entanglement of material infrastructures with the stories and struggles through which communities confront their uncertain energy futures.

## Limitations of the Present Study

While this thesis provides a rich and interdisciplinary analysis of energy infrastructures and imaginaries, it is not without limitations. The reliance on online ethnography during the COVID-19 pandemic restricted opportunities for in-person engagement with communities and infrastructures. Online methods allowed for broad and diverse data collection, but could not fully capture the embodied, sensory dimensions of living near energy infrastructures. This inevitably narrowed the depth of engagement with affective experience, an aspect central to understanding community perspectives.

The geographical focus on North Lancashire and Cumbria, while offering valuable insights into regional dynamics, also presents a constraint. These sites were selected for their historical and contemporary significance in energy debates, and for their accessibility during the research period. Yet this regional concentration excludes comparative insights from other geographies where energy imaginaries are shaped by different historical and political conditions. Questions remain about how resistance movements manifest elsewhere, particularly in postcolonial and global South contexts where inequalities around energy access and transition are often more starkly felt.

The decision to concentrate on coal and nuclear systems also entails exclusions. These infrastructures were chosen because of their salience in the Northwest of England and their resonance with broader debates about temporality and justice. However, this meant that renewable energy systems received limited attention. Their omission leaves open questions about how emerging infrastructures of wind, solar, or tidal energy are reshaping imaginaries and community relationships, and whether they reproduce or disrupt existing inequalities.

These choices reflect an effort to balance depth and breadth, prioritising historical legacies and sociocultural dimensions of energy over technical and economic detail. In doing so, the thesis makes a distinctive contribution to understanding the cultural and ethical stakes of energy transitions, while leaving space for further interdisciplinary investigation. By acknowledging these limits, I situate this research as part of an ongoing scholarly conversation and invite future work to extend its findings, addressing the gaps and challenges identified here in order to enrich our understanding of energy systems as cultural, material, and political phenomena.

### Energy Research Futures: Mapping New Pathways and Critical Perspectives

The findings of this thesis open several avenues for further research into the cultural and ethical dimensions of energy transitions. First, comparative work could extend the analysis beyond

North Lancashire and Cumbria to diverse geographic and cultural contexts, particularly in the global South where energy transitions often expose profound inequalities. Such studies could illuminate how disparities in resource allocation and governance shape community responses and resistance, and how Indigenous knowledge systems provide alternative models of sustainability grounded in ecological and communal well-being.

Second, future work might turn to speculative cultural forms. Genres such as science fiction, theatre, and digital media create imaginative spaces where energy futures are contested and re-envisioned. Examining how these forms mediate public understanding of risk, responsibility, and possibility would expand the insights of this thesis into broader cultural terrains and highlight the role of imagination in shaping transition pathways.

Third, intersectional approaches are vital for examining how energy imaginaries intersect with race, gender, and class. Communities already facing environmental injustice often bear the heaviest burdens of transition, while having limited influence in decision-making. Attending to these dynamics would advance energy humanities scholarship by connecting it more explicitly to questions of equity, labour, and social reproduction.

Finally, closer integration of cultural analysis into policy research could help to produce more inclusive energy transitions. Collaborations between policymakers, communities, and cultural practitioners could ensure that technical frameworks are grounded in lived experience, amplifying diverse voices and supporting more just forms of transition.

Taken together, these pathways underscore the importance of interdisciplinary and collaborative approaches. By combining cultural analysis with comparative, intersectional, and policy-oriented research, future studies can build on the framework of thermodynamic ethics developed here, expanding our collective capacity to imagine and enact more equitable energy futures.

## Epilogue: Inhaling Nostalgia, Exhaling Futures: A Return to Petrol-Charged Memories

I started this journey with the memory of a 1982 Ford Fiesta and the pungent smell of petrol, an experience that, even at seven or eight years old, impressed upon me the power of an energy material to evoke equal parts excitement and discomfort. That sharp scent, mingled with the promise of forward motion and the threat of carsickness, first taught me that energy, fossil fuels, in particular, can be profoundly intimate. It felt vital and enabling, yet also unsettling, an ambivalence which has quietly accompanied me into adulthood and guided my curiosity about our attachment to energy systems. As my research evolved, this sense of ‘cruel optimism’ (Berlant, 2011) became a thread running through every stage. Oil, or any fossil fuel, entices us with the promise of possibility, mobility, jobs, better futures, and yet refuses to deliver these hopes in full. Even as we discover the ecological and social costs of our entanglement with fossil fuels, we remain caught in a cycle of longing, fixated on its ephemeral promise of escape or new horizons. Like Berlant’s dream that never materialises, oil exerts a magnetic pull: a cluster of promises that keeps us tethered to a system of extraction, pollution, and fleeting gratification. Each car journey, flight, or train ride intensifies that longing for the next adventure, the next new life, but also reintroduces the same old whiff of carbon dependence that gnaws at our collective future.

Over the course of this PhD, I found myself returning to that interplay between corporeal experience and infrastructural entanglement. From the intimate bodily reactions we have to petrol fumes, to the sweeping social and political structures that channel our dependence on fossil fuels, energy shapes how we move, dwell, and dream. It frames our everyday routines

and our grandest aspirations; it is at once a thing we burn and a lens through which we imagine who we could become. This tension, between excitement at what energy can do and trepidation about its longer-term consequences, never left me. If anything, it became a guiding principle for understanding the paradox of how something so vital can also be so precarious.

Berlant's concept of the 'good life' also resonates here, as it reflects how our collective faith in ideals such as technological progress, cheap travel, and economic expansion persists despite repeated disappointments. This attachment to these ideals, even when they no longer deliver on their promises, mirrors Berlant's idea of 'cruel optimism,' where individuals continue to invest in unattainable or harmful aspirations because they provide a sense of purpose and continuity (Berlant, 2011). In my own life, I recall how the smell of petrol once signified freedom: a route to see family, a tangible sense of status (because we had a car), a ticket to somewhere else. Yet that optimism contained the seeds of its own undoing: cars break down, roads pollute, climate change intensifies, and the dream of fossil-fuelled mobility grows more unstable. Still, we keep searching for that next tank of petrol or that next ingenious energy fix. We circle back to the same question, can technology, policy, or consumer desire ever fully deliver on its promise without leaving behind scars of inequality and environmental harm?

In concluding this thesis, I recognise now that my initial affective spark, an embodied experience of petrol's promise and peril, laid the groundwork for an investigation into the cultural, ethical, and political dimensions of energy. Every chapter I wrote, whether discussing the transformation of landscapes, the activism of local communities, or creative expressions of alternative energy futures, has aimed to unravel that paradox: that a substance as mundane and familiar as an energy material can hold so much power over our imaginations and our lives. In examining what energy means to people, I see how we remain bound by the allure of a 'better life' that energy materials promise but never quite fulfil.

This final reflection, then, is my attempt to circle back to that smell of petrol, which has come to symbolise both the seductions and the shortcomings of our fossil-fuelled present. If there is a resolution here, it may lie in the imaginative courage we must cultivate: the willingness to think beyond the easy fix of fossil energy, to challenge the narratives of endless progress, and to open ourselves to forms of living that do not rely on extraction alone. While the child I once was looked at petrol as an emblem of freedom, I now see it as a cipher, an everyday yet deeply charged sign that urges us to consider how we might dismantle ‘cruel optimisms’ and instead fashion genuinely sustainable and equitable futures.

In many respects, this thesis has been about learning to smell differently, to sense the intimacies of energy in all their contradictory complexity. I hope that this work not only testifies to the potency of energy’s pull on our minds and bodies but also underscores the necessity of forging new attachments, new promises, and new imaginaries. Indeed, the task of rethinking our world’s reliance on fossil fuels is a formidable one, but as I have learned through conversations, creative projects, and scholarship, it is neither impossible nor without hope. Here, on the brink of this transition, may we hold onto what is difficult, daring to imagine a more just and livable world that goes beyond the fumes of the past.



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