A green extractivist railway? Exploring the political ecology of Europe's largest infrastructure project

Andrea Brock[1]

University of Sussex, UK

Abstract

'Environmentalists' tend to enthusiastically embrace new railway projects as desirable alternatives to more carbon-intensive aviation and road infrastructures. Yet, across Europe and beyond, communities and campaigners have resisted the building of high-speed railway projects and the violence they entail. The UK government's High-Speed Two (HS2) trainline, currently under construction, is one such project – Europe's biggest infrastructure project since World War II. While the British government continues to defend HS2 as 'green' and necessary, the project comes at enormous ecological and social costs, cutting through over one hundred ancient woodlands, exceeding its budget, and necessitating the eviction and resettlement of human and nonhuman communities along the line. Drawing on recent work in (anarchist) political ecology, (green) extractivism, and infrastructural colonization, and embedded in the history of colonial railways and extractivism, this article argues that the project should be conceptualized as green extractivist megaproject. In the face of determined opposition, HS2 serves to profit the British construction industry, political (economic) elites, wealthy commuters, and the City of London, and to uphold 'zero-carbon' imaginaries while expected to exacerbate the North-South divide and degrade environments. Green extractivist megaprojects, this case study shows, can reproduce the same injustices, violences, and social and ecological harms as other types of industrial developments.

Keywords: HS2, high-speed railway, green extractivism, United Kingdom, political ecology, anarchist political ecology, infrastructural colonization

Résumé

Les « écologistes » ont tendance à accueillir avec enthousiasme les nouveaux projets ferroviaires, qu'ils considèrent comme des alternatives souhaitables aux infrastructures aériennes et routières à plus forte intensité de carbone. Pourtant, dans toute l'Europe et au-delà, des communautés et des militants se sont opposés à la construction de projets ferroviaires à grande vitesse et à la violence qu'ils impliquent. La ligne ferroviaire High-Speed Two (HS2) du gouvernement britannique, actuellement en construction, est l'un de ces projets – le plus grand projet d'infrastructure en Europe depuis la Seconde Guerre mondiale. Alors que le gouvernement britannique continue de défendre HS2 comme un projet « vert » et nécessaire, le projet a un coût écologique et social énorme, traversant plus d'une centaine de forêts anciennes, dépassant son budget, et nécessitant l'expulsion et la réinstallation de communautés humaines et non humaines le long de la ligne. S'appuyant sur des travaux récents en écologie politique (anarchiste), en extractivisme (vert) et en colonisation infrastructurelle, et s'inscrivant dans l'histoire des chemins de fer coloniaux et de l'extractivisme, cet article soutient que le projet devrait être conceptualisé comme un mégaprojet extractiviste vert. Face à une opposition déterminée, HS2 sert les intérêts de l'industrie britannique de la construction, des élites politiques

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[1] Andrea Brock is a lecturer in International Relations at the University of Sussex, UK. Email: A.brock@sussex.ac.uk. I would like to thank everyone who took the time to talk to me and everyone who is active in land and forest defence in Britain and everywhere. This article could not have happened without you, and I hope can be useful in the struggle. I'd also like to thank the three anonymous reviewers and the SI editors, Judith Verweijen and Alexander Dunlap, for your useful comments and suggestions, as well as Justine Taylor for being a really wonderful fieldwork partner. In Alexander Dunlap & Judith Verweijen (eds.) (2023/4), The political ecology of green extractivism. Special Section of the *Journal of Political Ecology*.

(économiques), des riches banlieusards et de la City de Londres, et soutient l'imaginaire du « zéro carbone » tout en exacerbant la fracture Nord-Sud et en dégradant l'environnement. Cette étude de cas montre que les mégaprojets extractivistes verts peuvent reproduire les mêmes injustices, violences et dommages sociaux et écologiques que d'autres types de développements industriels.

Mots-clés: HS2, train à grande vitesse, extractivisme vert, Royaume-Uni, écologie politique, écologie politique anarchiste, colonisation infrastructurelle

Resumen

Los "ambientalistas" suelen acoger con entusiasmo los nuevos proyectos ferroviarios como alternativas deseables a las infraestructuras de aviación y carreteras, más intensivas en combustibles fósiles. Sin embargo, en toda Europa y fuera de ella, comunidades y activistas se han opuesto a la construcción de proyectos ferroviarios de alta velocidad y a la violencia que conllevan. La línea ferroviaria de Alta Velocidad Dos (HS2) del gobierno británico, actualmente en construcción, es uno de esos proyectos, el mayor proyecto de infraestructuras de Europa desde la Segunda Guerra Mundial. Aunque el gobierno británico sigue defendiendo la HS2 como "ecológica" y necesaria, el proyecto tiene un enorme costo ecológico y social, ya que atraviesa más de cien bosques centenarios, supera su presupuesto y obliga al desalojo y reasentamiento de comunidades humanas y no humanas a lo largo de la línea. Basándose en trabajos recientes sobre ecología política (anarquista), extractivismo (verde) y colonización infraestructural, e integrado en la historia de los ferrocarriles coloniales y el extractivismo, este artículo sostiene que el proyecto debería conceptualizarse como un megaproyecto extractivista verde. Frente a una oposición dedicada, el HS2 sirve para beneficiar a la industria británica de la construcción, a las élites políticas (económicas), a los viajeros ricos y a la ciudad londinense, y para mantener el imaginario de "carbono cero", al tiempo que se espera que agrave la división Norte-Sur y degrade el medio ambiente. Este estudio de caso demuestra que los megaproyectos extractivistas verdes pueden reproducir las mismas injusticias, violencias y daños sociales y ecológicos que otros tipos de desarrollos industriales.

Palabras clave: HS2, Alta velocidad ferroviaria, extractivismo verde, Reino Unido, ecología política, ecología política anarquista, colonización infraestructural

1. Introduction

'Environmentalists' tend to enthusiastically embrace new railway projects as desirable alternatives to more carbon-intensive aviation and road infrastructures. Yet, across Europe and beyond, communities and campaigners have resisted the building of high-speed railway projects and the violence they entail. The UK government's High-Speed Two (HS2) trainline, currently under construction, is one such project – it was to be Europe's biggest infrastructure project since World War II. While the British government continues to defend HS2 as 'green', the project comes at enormous ecological and social costs, cutting through over one hundred ancient woodlands, exceeding its budget, and necessitating the eviction and resettlement of human and nonhuman communities along the line. This article argues that the project should be conceptualized as a green extractivist megaproject. In the face of determined opposition, HS2 serves to profit the British construction industry, political (economic) elites, wealthy commuters, and the City of London (its financial center). It upholds 'zero-carbon' imaginaries while expected to exacerbate the North-South divide and degrade environments. Green extractivist megaprojects, this case study shows, can reproduce the same injustices, violences, and social and ecological harms as other types of industrial developments. The HS2 project provides a powerful example of a green capitalist and green extractivist project that is embedded in narratives of progress, growth, and sustainability, while facilitating ecological and social degradation.

The article does not present a general critique of railways, or even high-speed railways, as inherently damaging, extractivist, or unnecessary. The social changes necessary to mitigate the very worst effects of the climate catastrophe and the restructuring to adapt to new social-ecological realities of course require radical changes to our transport system, including a better, more efficient, and affordable rail system. Instead, I suggest that ownership, speed, and control over railway decisions matter – and the impacts of high-speed railways, just like any technology, reflect the socio-ecological relations and political economy they are embedded in. If railway projects are part of a neoliberal capitalist system dominated by the need for growth, profit, and speed,

rather than public benefit and ecological sustainability, they may well end up reproducing and entrenching the same ecological and social degradation. Instead, sustainability in the transport system, as I will return to in the conclusion, would require far reaching *social*, not just *technological* changes, democratization, autonomy, changes in control and in ownership, and rejection of the sanctity of speed and growth.

To develop this argument, I first introduce some key political ecology ideas and concepts that help us think through the relationships between extractivism, high-speed railways, and infrastructural colonialization. This involves a brief look at the contestation of contemporary mega-transport infrastructure projects 'and their worlds' (Mauvaise Troupe Collective, 2018). Second, I briefly explore the historic role of railways in colonial history and their importance to extractivist operations. Third, I introduce and analyze HS2, drawing on the concepts developed above, and examine its green claims and ecological and social costs in order to position it as green-extractivist megaproject embedded in an ideology of growth, markets, and capital in the face of economic decline.

Throughout this analysis, I aim to bring railways in conversation with emerging debates around 'green extractivism.' While much political ecology analysis and scholarship on (green) extractivism focuses on the global South, not least because that is where sacrifice zones for global energy transitions and development tend to be concentrated – for lithium mining for e-mobility, for instance – few scholars[2] have examined green extractivist projects in Britain or Western Europe, the heart of the beast of capitalism, industrialism, and 'modernity.' Contributing to the (slowly) growing political ecology literature of the Global North (e.g., McCarthy, 2002; Schröder *et al*., 2006; Hamilton & Trölenberg, 2023), here, I thus aim to provide a European case study that explores HS2 as green extractivist mega-project that is enforced in the face of combative resistance.

The article is based on 16 in-depth interviews[3] and dozens of informal conversations, repeated field visits, and approximately six weeks of participant observation[4] between 2019 and 2021. Personal accounts were complemented with analysis of documents, news articles, policy documents, FoI requests, and blog posts. It thus draws on and is embedded in years of engagement with anti-HS2 and other ecological direct action struggles. I do not claim any kind of objectivity or neutrality but, like every researcher, I write from a particular ethical and political perspective; as someone who is extremely concerned about ongoing and accelerating ecological crises and injustices and the loss of human and nonhuman habitats. My positionality and analysis are shaped by my own participation in the struggle. This positionality is reflected in the focus of this work – not an analysis of the resistance against HS2, but an analysis of the framing, repression around, and political economy underlying the project. As Marv Waterstone put it: "All scholarly work is political (and activist). The only relevant questions are whether the scholar engages in political/activist work consciously or unconsciously, and whether that work supports the status quo, or attempts to subvert it (for either regressive or progressive social change)" (2006: 116-117).

2. (Green) extractivism, megaprojects and infrastructural colonialization: towards a political ecology of high-speed railways

Extractivism, infrastructures, and their statist and colonial dimensions and linkages are key concepts in my analysis of HS2 as green extractivist megaproject that is part of ongoing "infrastructural colonization" (Dunlap, 2020, see below), and requires some exploration. Originating in Latin America, the concept of extractivism (Dunlap, Verweijen & Tornel, 2024) was developed to understand the social and ecological costs of resources extraction – embedded in wider questions of political economy and colonial dynamics. For many, it has now come to signify a wider approach to relating to ecosystems and ecologies; "a complex ensemble of

[2] Notable exceptions include, for instance, Dunlap & Riquito, 2022; Hamilton & Trölenberg, 2023; and a number of scholars examining the resistance against No TAV (Engel-Di Mauro, 2013; Leonardi, 2013; Armano *et al*., 2013)

[3] Interviewees were snowball sampled, starting with pre-existing connections and relationships. They included landowners, campaigners, researchers, and land defenders. Interviewees were not chosen to be representative but according to experiences and knowledge of repression and the political economy of HS2.

[4] Participant observation involved spending time (including camping) in four different resistance camps, participating in camp life, demonstrations, and other resistance activities. Field work periods added up to approximately two months.

self-reinforcing practices, mentalities, and power differentials underwriting and rationalizing socio-ecologically destructive modes of organizing life through subjugation, violence, depletion, and non-reciprocity" (Chagnon *et al*., 2021: 760). While not every scholar of extractivism agrees (cf. Gudynas, 2018), many have come to use extractivism not only in relation to projects that involve the physical removal extraction of resources from the ground, but as a lens through which to understand the statist colonial logic and ideology of extraction and exploitation for value creation. Extractivism, as a mode of accumulation that began with colonization (Acosta, 2013), thus describes a way of "world-making, determining, and making demands on most aspects of modern societies, and on the overall organization of the world system and its dynamics" (Chagnon *et al.*, 2021: 761) – a way of life. From its inceptions, students of extractivism have analyzed extractivism as a "a mechanism of colonial and neocolonial plunder and appropriation" (Acosta, 2013: 63), causing social degradation as well as ecological harm. Colonialism itself is has always been about extraction from the colonized – human and nonhuman.

In practice, this points to the extractivist dimensions of a range of activities, from agriculture (McKay, 2017) to digital extractivism (Chagnon *et al*., 2021) and epistemic extractivism (Grosfoguel, 2020) in academia and 'scientific' knowledge production (Cruz & Luke, 2020). They are characterized by social relations of exploitation – as opposed to, for instance, reciprocity (Kimmerer, 2015) – prioritization of growth and production over human and ecological health (Preston, 2017), privileging state and corporate actors over communities and their ecosystems, and framing and accepting in the language of costs and benefits, denying interconnections between humans and nonhumans.

Extractivism and infrastructures, Alexander Dunlap has argued, are the two sides of the socio-ecological coin (2023). The focus here lies on "mega-infrastructures" – grandiose, landscape transforming projects, often spanning across several countries or regions, involving multiple public and private actors – [that] reorder capitalist relations across the globe, producing infrastructural spaces wherein rationalities of capital accumulation materialise" (Lesutis, 2021: 1). Such projects are key to the enablement and facilitation of extractivism, and are themselves extractivist in the human and ecological relations they embody. To understand the ways in which they enact state and corporate interests of accumulation, extraction and social control it is useful to explore them through the lens of "infrastructural territorialisation" (Lesutis, 2021: 1). This territorialization might involve "bureaucratic land grabs" (Dunlap, 2020) where land is designated as development land with little democratic control, and often against local resistance. Alexander Dunlap has examined these processes as "infrastructural colonization" (2020) that not only "dispossess populations and 'roll out' an apparatus of spatial, economic and psychosocial management" (Dunlap & Correa-Arce, 2022: 7) but enchant people through promises of speed, connectivity, convenience, and economic opportunity and normalize socio-ecological plunder (Dunlap, 2021a). Infrastructures colonize not only human and nonhuman habitats but also "habits, social relationships and political action. The psychological operations of 'green' marketing, then, are intimately intertwined with infrastructural coloniality" (*ibid*: 6). Infrastructures, he states, are themselves processes of socio-ecological conquest, and the state, anarchists have long argued, continues to colonize, extract, and subjugate people(s) and habitats.

Drawing on Paul Virilio's conceptualization of the colony as the model of the political State, which began in the city, spread to the nation, across the communes, and reached the stage of the French and English colonial empires" (2008[1983]), Dunlap invites us to examine colonization as "processes to spread a form of organisation emblematic of the ideology, form and purpose of the European political state" (2018: 553). Infrastructures are key to this deepening of state power, "colonizing, subjugating and absorbing different peoples into destructive socio-ontological and ecological practices" (2021a: 11). Colonialism and statism are thus always also infrastructural (Dunlap & Arce, 2022). British (settler) colonialism and imperialism has required the domestic pacification and colonization of its subjects before being able to spread across the world. Understanding statism as colonialism (Dunlap & Tornel, 2023) thus allows us examine infrastructural colonization at the heart of the empire, in Britain.

The psychological and state-building dimensions of infrastructures are rarely discussed in relation to contemporary projects, especially in the global North. Indeed, too rarely we explore mega infrastructures in the global North in relation to state power, which is so deeply materially and psychologically entrenched and rarely questioned – yet, its very legitimacy depends on large energy/telecommunications/transport projects such as

HS2, and contemporary green capitalist/extractivist projects more generally. At the same time, infrastructures further entrench (lock-in) hegemonic systems of accumulation and state power; they can play a police function locking in hierarchies of race, gender, nationality, caste, and respectability; and channeling economic performance (Karakuu, 2019).

'Green extractivist' projects are grounded in similar assumptions and ideologies. Green extractivism (Dunlap & Brock, 2021; Dunlap, Verweijen & Tornel, 2024) is framed as 'sustainable' and part of green transitions, while continuing the same extractive logics and processes that are part of capitalist modernity and the strive for 'progress'; often causing sacrifice zones, facilitating ecological and social harm under the narrative of environmental benefits. These narratives serve "to legitimize and further commodify nature… while expanding extractivism" (Tornel, 2023) and are grounded in sustainability discourses that underlie the "state-extraction-ecocide nexus" (Brock, 2020a: 3). This 'binding together' helps invisibilize and discursively bridge the contradictions between sustainability and extractivism by 'greening' mega infrastructure projects and making them the socially more palatable face of industrialism, capitalism, and state power. This involves social engineering and (corporate) counterinsurgency techniques (Brock & Dunlap, 2018) to shape the hearts and minds of people, manage and coopt dissent, and manufacture dissent (Tornel, 2023; Brock, 2020b; Verweijen & Dunlap, 2021).

Recent work in (anarchist) political ecology (Brock, 2020a; Springer *et al*., 2021, Locret-Collet *et al*., 2021; Mateer *et al*., 2021) shows the intricate connection between ecological and social degradation, oppression and domination, as evident in the rallying cry against "fracking democracy", for instance (Brock, 2020a). They help analyze the close links between ecological harm caused by extractivist/infrastructural projects and the violence they entail, often through the presentation and understanding as banal and technical (Laduke & Cowen, 2020). This work helps oppose and challenge the anthropocentrism that shape most social science frameworks and recognize the embeddedness of humans in the web of life, and the multifaceted ecological and social crises that are sometimes invisibilized through a focus on climate catastrophe.

This critique of the 'carbon reductionism' that is integral to much scholarship and environmental/climate justice activism is important to understand the problems with the carbon accounting underlying the climate credentials of high-speed rail projects. A framework informed by anarchist political ecology rejects the objectification, commodification, and separation of nonhuman nature that carbon accounting exemplifies, with the explicit goal to support mutual aid and direct action (see also Dunlap, 2022). Instead, it points to violence against non-humans and the role of policing to enforce and defend a social and *ecological* order (Brock & Stephens-Griffin, 2021), and advocates for total liberation (Pellow, 2014; Springer, 2021). In other words, it rejects all forms of inequality and domination, shares "an ethic of justice and anti-oppression inclusive of humans, nonhuman animals, and ecosystems" (Pellow, 2014), while critiquing the systems of domination and hierarchy that structure human societies as well as human-nonhuman interactions.

Such a critique recognizes the important role of infrastructural colonization in upholding these systems and problematizes the role of the state; helping us overcome the liberal heritage that continues to position the state as protector, to which all authority and 'natural rights' are to be ceded. This can help to overcome statism in academia too, to challenge the state hegemony in political imaginations, and to problematize and question some of the underlying categories and relationships such as between statism, extractivism, and ecocide, and the alienation, human-nature separation, extractive dynamics, and ideologies of profit and control that lie at the heart of ecological crises.

High-speed railways can be manifestations of this logic. Their green extractivist nature lies not only in their function within the broader political economy, but also in their role in the colonization of ecologies and psychologies, linked to the extraction of value from more remote places, connecting them to the world of high speed and capital. Such infrastructures can "replicate colonial/statist [extractivist] sociocultural values in the local" (Dunlap, 2020: 112). This is about mobility in the service of capital and state power, as this case study will show. Those resisting high-speed railways thus often contest knowledge systems, social(-ecological) relations, and political economies rather than new technologies. Taking this seriously helps us see through the veil of sustainability discourses that are used to justify infrastructure projects and uphold the state-extraction-ecocide nexus (Brock, 2020a: 3). In the next section, I thus explore the links between extractivism, colonialism, railways, and ecological destruction.

3. Extractivism, colonialism, and railways: a short and incomplete history

Railways are not usually conceptualized as extractivist projects. Yet, "[w]orld railways were a primary tool of imperialism, shrinking time and space to permit the global movement of goods and capital as well as helping to consolidate smaller states", argues Michael Minn (2013: 188, drawing on Robinson, 1991). There are several ways in which they are linked to extractivism both historically and in the contemporary political economy, driving infrastructural colonization. The building of railway construction in the colonies not only facilitated extractivism by enabling the export of wealth and key commodities, but the construction itself was an extractivist endeavor exploiting human and nonhuman labor and financed – especially in Britain – through colonial money. When private British companies built the first railways in India in the middle of the 19th century, the purpose was not, of course, to 'develop the colonies', as it is often claimed, or even solely primarily military purposes. The intention was to transport and extract important resources – most notably cotton, coal, and iron ore (Bagchi, 1982). Indeed, historians have shown that important railway routes were chosen according to commercial criteria, not to take the shortest and most effective military course (Macpherson, 1955). The colonial administration was explicit about the 'real objective' being "to develop the resources of that district", as the Government Director of Railways explained in relation to the cotton regions near the Ganges that were to be connected to the trade routes (*ibid*: 178):

> The demand for railways to penetrate markets came mainly from British manufacturers of consumption goods, especially cutlery, hardware and textile… continued pressure of cotton textile interests in Manchester and Glasgow, who saw in railways the means of flooding India with their manufactures… [and] efforts to prevent the growth of a modern textile industry (Macpherson, 1955: 183)

In the early 19th century, 80% of raw cotton that was imported to Britain came from North America, compared with 13% from India (*ibid.*). This came to be politically dangerous, not only because of the possibility of harvest failures, but because "the future emancipation of the negroes was likely to disrupt the economy of the Southern States" (*ibid.*). The outbreak of the Civil War and the Union blockade of Confederate ports led to the collapse of cotton trade to Britain and "sent shockwaves through European markets" (Ross, 2017: 30). In response, cotton prices surged, and cultivation grew rapidly in India and Egypt. Within two years, Indian cotton increased from 15 to 75 percent of British cotton imports in 1862 (*ibid.*). In India and Egypt, railway construction expanded rapidly, pushed by governments and private capital (*ibid.*). "The construction of the first railways in India was the outcome of the work and negotiations of [private] promoters"… "allegedly sent out to India on behalf of the cotton interests of Manchester", although the precise motives were not always clear (Macpherson, 1955: 182).

The routes were designed to facilitate cheap transport of goods between the ports and the interior, rather than to connect places in the interior (Bagchi, 1982). Coal was crucial for transport of extracted resources and improving this transport for export (especially raw cotton) was also the explicit business of the British Government (Macpherson, 1955). Coal extraction, in turn, was important to improve railway transport and better railway transport key to exporting cotton and coal (Mitchell, 2009: 403).

The development of railways and irrigation systems turned India into a major supplier of cotton for Europe and its colonies (Ross, 2017). Cotton trade – and railway construction – were themself highly extractive, as Hornborg's (2003) analysis of the unequal ecological exchange involved in Britain's cotton trade showed. While equal on paper, the land, (slave) labor, water, and ecological destruction that cotton agriculture involved was a multiple of that of manufactured cotton from Britain. Drawing on government records, parliamentary reports, and newspapers, Pallavi Das illustrated that "much of the deforestation seen in the Himalayas today can be traced back to the second half of the 19th century when railway construction began in colonial India" (2011: 38). Railway construction – linked to colonial extraction – led to the depletion of India's natural resources, including forests (*ibid.*). These developments colonized vast amounts of land and labor, at huge ecological and social costs.

The result was not only ecological degradation but also the transformation of human-nature relations in India *and* Britain. Cotton was key to industrialization in Britain, not just for disciplining labor and as key accumulation strategy, but also because this is where new modes of accumulation were first developed (Ross, 2017). "In place of a diffuse global web of exchange in which techniques and resources were broadly shared, industrialization in Europe created a more centralized and exploitative 'empire of cotton'" (*Ibid.*: 26, citing Beckert, 2014). India, on the other hand, saw the creation of sacrifice zones for imperial development. The construction of railways to transport resources actually led to *deindustrialization* in India, as processing took place in British factories, and "increased the intensity of dominion of advanced capitalist countries" (Bagchi, 1982: 34). Through increasing importance of export crops and commodification of land, it deepened capitalist social relations, enhancing the power of landowners, traders, and money lenders over those working the land. The railways thus helped extend processes of colonization and helped Britain to retain India as the principal market for British industry (Habib, 1975). Cotton plantations, meanwhile, are manifestations of extractivism that exploit and harm humans, nonhumans, and ecosystems.[5]

In the meantime, railway construction in Britain benefitted from colonial extraction and was key to the transport of resources. British capitalists were particularly important in railway construction and financing – Bristol capitalists were key in the construction of the Great Western Railway, for instance (Channon, 2001). While framed as technological 'progress', Alf Hornborg has questioned this rationale:

> Most technology can be visualized as devices for 'saving' time or space: 'saving' time by increasing velocity (e.g., railways, cars, airplanes) and 'saving' space by intensifying the use of land (e.g., through high-rise buildings or modern agricultural machinery). What we seldom take into account is that this local 'saving' of time and space is made possible precisely by the expenditure or loss of time and space elsewhere in the global system… railways in the 1840s may have saved time—and accessed more space—for those who could afford to use them, but obviously at the expense of the labor time of vast armies of miners, loggers, steelworkers and railway workers, as well as of the natural spaces where clearcuts and strip mines were all that remained of the landscapes that had to be sacrificed in the name of technological progress. (Hornborg, 2003: 7).

In other words, British railway construction has always been entangled in global extractivism through the flow of money, resources, and labor; requiring huge amounts of steel and concrete and destroying and fragmenting habitats. Globally, the development of railways not only *facilitated* extractivism – especially cotton and coal – by providing transportation, but it also *required* extractivism, as railways were running on coal. The process of railway development caused sacrifice zones and infrastructural violence along railway routes and supply chains to make industrialization in Britain possible. In the meantime, colonial extraction facilitated the building of railways in Britain (and the US, Patnaik, 2017: 302), in turn facilitating coal transport. Railways were crucial for industrialization and urbanization, and thus the further commodification of land. But railways were also – and continue to be – key to state and empire building and consolidation of British (colonial) power, and to secure accumulation and growth. State power is behind infrastructural colonization and the push for extractivism, and thus directly linked to the development of railways.

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[5] In Nigeria, similarly, the British commissioned a number of railway projects to facilitate the production of cash crops for export, especially agricultural products (Chimee, 2014). In turn, this increased demand for coal mining "to power trains, furnaces in the tin mines, and steamships" (*Ibid.*: 20) to facilitate extraction. Some 50% of Nigeria's coal was utilized for running railways (Chimee, 2014). Railway development frequently required forced labor which in turn required a legal architecture that would coerce Africans to work in the mines, railroad construction and agriculture. It also facilitated the destruction and degradation of ecologies both in their construction as well as the resulting expansions of plantations and mining operations. French and Belgian rule in Central Africa involved, for example, the construction of a cross-country railway road through the rainforest of Mayombe in the Congo that led to the deaths of thousands of workers, and intrusion into and destruction of habitats. Massive government-run forced labor camps for later railway work facilitated the emergence and spread of diseases, including, Pépin suggests, the predecessor of the HIV-1 virus (SIV_{cpz}) and its ability to live and spread in human organisms (Pépin, 2011). Across the colonies, railways were thus key to ecological degradation and facilitation of extraction and exploitation.

3. High speed railways in a high speed world

Having briefly explored some of the colonial and statist dimensions of historical railway development, how does this help us analyze contemporary high-speed railway projects? It provides us with a starting point to understand them as political projects embedded in particular social and ecological relations and ask questions about who and what drives such projects, how they are linked to the contemporary (high-speed) political economy, and their social ecological impacts. This section will review some contemporary projects and their contestation.

Until today, surprisingly few critical political ecologists have turned their attention to high-speed railways, their huge ecological footprints – direct impacts (ecosystem degradation, habitat fragmentation, electricity needs) and indirect ones (resource use, opening up new ecosystems for exploitation and extraction, and facilitating more consumption and trade). There are also major social impacts. A contemporary example is China's Belt and Road Initiative (BRI) which encompasses "a mind-boggling range of extractive activities" (Li & Shapiro, 2021: 135) including the rapid expansion of railways to extract and transport resources across Asia. Li and Shapiro argue that it is 'double extractive', as "raw materials, foodstuffs, scenery, talents, and other benefits move toward the Chinese market, while coal-fired power plants, polluting manufacturing plants, land degradation, intensification of production, cultural appropriation, and many other forms of social and environmental harms flow from the Middle Kingdom" (*ibid.*: 137).

Another project includes the 1,525 km intercity railway development 'Tren Maya', a state-led mega-infrastructure project envisaged to attract yet more tourism to Southern Mexico. The line has cut through the Yucatán Peninsula and will extract and accumulate value through (eco-)tourism initiatives and be built and run by the army, with private firms, including the German *Deutsche Bahn* involved in construction. The US$7.4bn project (BBC, 2018) is threatening ecologically sensitive areas, cutting through nine conservation habitats, and constitutes a flooding risk. Similar to HS2, it is justified as helping 'develop' areas of the country that have been 'left behind', in the words of the Mexican president, to help pay off the "historical debt with the south-east" of the country (Soler, 2022). It has been analyzed as reproducing "modernist development, territorial control and capital accumulation" (Tornel, 2023), reproducing colonial ideas of southern Mexico being land 'outside' of development (Hesketh, 2021), and reorganizing 'underdeveloped' territories into transit routes made legible for capitalist investment and mobility (Tornel, 2023), suitable for infrastructural colonization and extraction. Mayan communities who live in these areas and whose livelihoods depend on the land have critiqued the imposition of the project, its ecological impacts, and the lack of consultation: "this isn't just about a train line; It is a project of territorial reorganization that seeks to turn the peninsula into an industrial corridor" (Pedro Uc Be, in Mongabay, 2022). (Neo)colonial arguments for large infrastructure projects as 'development' are heavily contested by communities in Mexico and elsewhere.

Analyzing life and death along the coal rail in Colombia, Lina Jakobsen (2020) explores railways and the social harm they may cause as 'productive of corporate territorialization' and 'justifies corporate social control. She recounts the traumatic relationship between local indigenous Wayuu communities and the train as an "occupation both concretely and symbolically": "For example, one elderly traditional authority in a Wayúu community along the railway explained that the company, with its train, 'has taken over our territory; now it is not ours.'" (*ibid.*: 5). This conceptualization as detrimental manifestation of modernity, interrupting local socioecological relations, is a recurring theme pointing to the infrastructural colonization that these projects constitute. It was shared by people resisting the Konkan Railway project in Goa, India, for instance, who questioned the science and expertise underlying the project, instead promoting different sets of values and knowledge (Jaiswal, 2018). They "often juxtaposed expert knowledge and modern ways of knowing with local knowledge and wisdom" (*ibid.*: 270).

What Kristin Ross describes as "large, imposed, and useless" infrastructural projects often trigger opposition, occupations, and blockades in the global North too (in Mauvaise Troupe Collective, 2018: 1).[6] Often, these struggles are struggles not just *against* a particular project and the world of speed, competition, and growth it represents, but *for* land and autonomy. Examples include the ZAD in Notre-Dame-des-Landes in France, the Sanrizukata movement in Narite, Japan, and the No Tav movement in Susa Valley, Italy – against

[6] See, for instance, the Forum Against Unnecessary and Imposed Mega Projects (in Burballa-Noria, 2018)

a new airport, an international airport, and the Turin–Lyon high-speed railway, respectively (in Mauvaise Troupe Collective, 2018). The TAV (Treno ad Alta Velocità) in Susa Valley is part of an EU project to connect Lyon to Budapest and Ukraine and has been opposed by many of the 70,000 people in the Italian Susa Valley for over twenty years (Mauvaise Troupe Collective, 2018). Despite harsh repression and designation of the project as of "strategic interest", they critique the project as useless and unnecessary, causing ecological and social devastation to the valley, destroying villages and businesses, while profiting private companies. People question the very idea of development behind the project, the benefits to private companies and its function as "structural transference of public to private wealth"; moving from a critique of big infrastructure to critique of political representation and a crisis of legitimacy (Armano *et al*., 2013; see Brock, 2020a for a similar argument in relation to fracking opposition). Strong resistance has formed "against the idea of sacrificing people's lives to a huge but useless logistic platform for the sake of commodity circulation and the transformation of land and communities into an open 'space of flows'" (Armano *et al.*, 2013: 23) and for self-determination, new socialities and ways of being (Leonardi, 2013).

Ryan Katz-Rosene (2014), analyzing the political economy of high-speed railways in Canada, positions high-speed rail as "an 'ecological fix' – a neoliberal tactic, employed by states and capitalists in search of profit, wherein innovations are proposed as a means of externalizing and internalizing socio-environmental conditions" (*ibid.*, ii). Closely tied to ecological modernization, ecological fix, he argues, helps us understand the role of infrastructural megaprojects in providing outlets for capital in search of profits – for (trans)national interests tied to state/mafia structures in the TAV case (Engel-Di Mauro, 2013), and the construction industry linked to government elites in Britain, I suggest below; in an economy where many industries have long experienced decline (manufacturing) or stagnation (services) and construction provides growth. Eco-fixes don't challenge business-as-usual but consolidate capitalist processes by externalizing true socio-ecological impacts (*ibid.*: 13). High speed railways, Katz-Rosene argues, don't challenge unsustainability or "automobility" (Paterson, 2007) as a cultural and political system which privileges and reifies car dominance, but reflect the underlying social and political conditions (Katz-Rosene, 2014; Minn, 2013).

Ross describes such struggles against high-speed transport systems – including, but not limited to aviation – as "a war between two dueling logics, two argumentations, two knowledges, two futures… the 'airworld' versus the territory" (*ibid.*: 17). The "airworld" represents global (luxury) trade, fast transport, connecting cities but destroying towns and countryside: "*frictionlessness* – the ability to move people and goods in and out as quickly and effortless as possible"; where "[p]eople and things, torn from their living entanglements, are freed to become mobile investments in a world where the fungibility of space is taken as a given" (*ibid.*). Opposition against high-speed railways is often not just *against* a trainline: "it is no longer with high-speed transport *per se*, but with its world: a world of class-division that identifies human progress with economic growth and defines human needs in terms of markets and the submission of all the world's resources to markets. The high-speed world is one in which the value of any item of earthly life is calculated to the service to capital" (*ibid.*: 18). This 'world', grounded in the ideology of growth, markets, and capital, in high speed for tourists, wealthy commuters, and commerce, at the cost of local connections to land and people, is resisted by people across the world. They come together not only to defend their ecosystems and to build new social relations with the soil and the land, but with each other too – through collective organizing and living differently. It's "merging life with revolt, and balancing confrontation with community, non-hierarchical resistance" (Mauvaise Troupe Collective, 2018). Concretely, this may involve land-based resistance and occupations, collective organizing, mutual aid, solidarity, and permaculture – fighting together and eating together, sharing and reconnecting to the land. But this resistance is in no way united – high-speed rail projects have long divided ecological movements across Europe, with different visions on how ecologically sustainable societies should be organized. While the European Green Deal includes plans to double high-speed rail by 2030 and triple it by 2050 – to 'modernize' the transport system (European Commission, 2021), even factions of European Green parties support and reject such projects, as the UK case illustrates (Foot, 2021). The next section now turns to high-speed rail in the UK.

4. Introducing HS2

> HS2 is not just a train line. I have already seen the transformative change that this project is triggering in Old Oak Common, Birmingham and elsewhere even before spades hit the ground next year" (Transport Minister Robert Goodwill in Gov.uk, 2016)

> Some trains run on coal, diesel, electricity – HS2 runs on lies (Interviewee)

HS2 is a high-speed cross-country railway project overseen by the UK government, originally meant to connect London and the Channel Tunnel to mainland Europe (HS1) with Leeds and Manchester. While the history of the project can be traced back over at least half a century, in its current form it was established in 2009. Construction started in 2020 and completion was planned between 2037 and 2043. Only the section between London and Birmingham has survived government cutbacks announced in 2023. Initially approved to cost £33bn (US$42bn), the budget rose to over £100bn (US$128bn) and was still growing before the announcement (Railway Technology, 2020), making it the largest and most expensive post-war development in the UK. Some estimated its real costs at over £155bn (US$198bn) (Lord Berkeley, 2022). In his six-month report to parliament, Transport minister Andrew Stephenson (DfT, 2021a) laid out its rationale:

> HS2 remains at the forefront of our long-term investment plan to better connect people and places, boost productivity and create jobs to help rebalance opportunity across the UK. Just as importantly, HS2 will play a pivotal role in creating a greener alternative to regional air and road travel. This is essential if we are to meet our commitment to bring greenhouse gas emissions to net-zero by 2050.

The UK government's support for new high-speed rail (rather than investment into existing rail networks, for instance), forms part of a global resurgence of high-speed railways involving countries including the US, China, Algeria, India, Iraq, Malaysia, Uzbekistan, and beyond, Katz-Rosene shows (2014). The UK were relatively late to the game, completing High-Speed 1 – the Channel Tunnel Rail link to mainland Europe – in 2007 (Martínez Sánchez-Mateos & Givoni, 2012). For decades, British governments had prioritized the motorway network and aviation expansion at the cost of railway modernization, emphasizing cost-effectiveness and privatization over strategic thinking (Glover & Milmo, 2009).

The history of the railways in Britain is a history of repeated privatization and nationalization, or, "socialising losses while privatising profits" (Brett & Buller, 2020). Both world wars led to government taking control of UK railways (Jones, 2017) and the previously state-owned British Rail was privatized at the end of the 20th century, leader to increases in fares, infrastructure failures, neglect of infrastructures, more delays, and passenger dissatisfaction despite the doubling of rail subsidies (Stittle, 2018). The political economy of railways in the UK is thus characterized by privatized rail franchises and foreign government ownership, such as the Dutch government's sole or majority ownership of West Midlands Railway, East Midlands Railway, and ScotRail through its state-owned rail operating company (Brett & Buller, 2020, see Figure 1). Until today, we see unusually low levels of public investments and many areas of the national network are in a very poor state. Yet, that does not mean lack of government interference; the government was instrumental in many of the political decisions and the creation of the power structures that incentivized railway neglect, pressure to reduce staff and save costs, breaking trade unions, and ensuring competitiveness and austerity as driving principles (Haines-Doran, 2022).

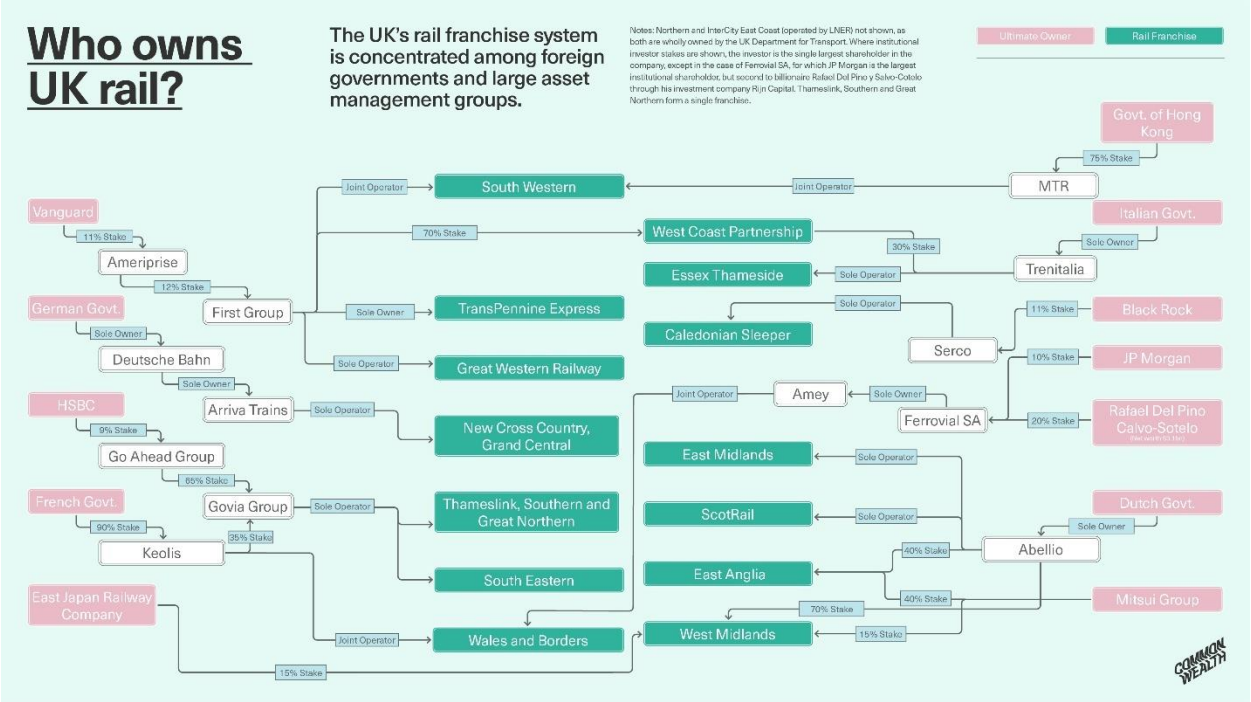

Figure 1: Who owns UK rail? (Brett & Buller, 2020)

In the face of these continued pressures, HS2 is positioned as a means to increase rail capacity, 'boost productivity', deliver economic growth, reinvigorate the UK economy, drive connectivity, and before partial cancellation in 2023, to bridge the gap between the capital and more deprived areas in the north of the country – a 'boost to the North' (McLoughlin, 2015, HS2 Ltd., 2021a, 2021b). In addition, the project is meant to 'make Britain greener' – taking passengers and freight off the roads and domestic flights, contributing to climate reduction targets and green growth (*ibid.*). It was framed as improving air quality, benefiting up to 30 million people, and boosting the tourism industry by connecting cities and national parks. These justifications already point to the importance of the project for the state in the face of economic decline and climate policy failures, to which we return below.

Despite continued verbal support by the government, the Eastern leg of the project (Birmingham-Leeds) was cancelled in 2021, and a connection linking Crewe to Manchester to facilitate faster trains to Scotland was cut in 2022. The construction of the London terminus was pushed back to 2040. Many speculated that more cuts might be coming, in the face of exploding costs, economic budget deficits, Brexit, and continued resistance and unpopularity. These came in 2023. In late 2022, 27% of the British public supported the project, and 35% opposed it, according to the government's own figures (Yougov, 2022). Local community groups and residents long opposed the project, and especially the displacement and ecological destruction along the route, through legal and political means, grassroots organizing, and local and national campaigning. The StopHS2 coalition, set up in 2010, supports local action groups and encourages campaigners to be creative in their resistance, organizing alternative consultation events, setting up action groups, organizing events and demonstrations, creating materials and press coverage, engaging with review and consultation processes, and lobby government (StopHS2, *About us*). For many years, people took legal action and fought injunctions, took part in consultation processes, and participated in local municipal/council politics.

The first resistance camp along the trainline was set up in 2017, and the last camp was evicted in 2022. For years, land defenders camped and occupied sites along the route, built tree houses and forest defenses, dug tunnels, and took direct action to stop HS2 construction work. In January/February 2021, protesters spent 31

days underground occupying a 30-metre (100ft) tunnel network under the rail terminus at London Euston station, costing HS2 Ltd. approximately £3.8m (US$4.8m), according to *The Guardian* (2023). The state responded with full force, violently evicting and arresting protesters, especially during the Covid 19 lockdown under little to no press coverage (see Brock & Goodey, 2022).

The resistance forged unlikely alliances between rich landowners and protesters, liberals and anarchists, and managed to push HS2 and its ecological impacts into the national media. In response, HS2 Ltd was forced to strengthen its 'green' profile, invest in sustainability measures, and promise running on 'zero carbon energy', as we explore below.

5. A green extractivist megaproject?

> This is not a train. It's a megaproject (Interviewee)

From the beginning, campaigners insisted that HS2 was 'a megaproject, not a train.' Megaprojects, Gellert and Lynch suggested (2003: 15–16), are "projects which transform landscapes rapidly, intentionally, and profoundly in very visible ways, and require coordinated applications of capital and state power." They involve "rent-seeking intentions…, under-estimation of costs, over-estimation of demand, exclusive decision-making processes and insufficiently acknowledged social and environmental impacts" (Burballa-Noria, 2018: 155). We will revisit these dimensions throughout the next four sections.

Conceptualizing HS2 as a megaproject, not a train, helps understand how investment in HS2 does not represent a break with the decades of neglect of the rail system and infrastructural decay, especially in the North of the UK. Indeed, the government's plan for reform sets out a target of £1.5bn (US$1.9bn) in savings over five years (DfT, 2021b). Instead, Katz-Rosene puts it well: HS2, he argues, reflects a

> …roll-out form… of neoliberalism in which targeted investments were legitimized in certain contexts – particularly in the wake of financial recession in both the UK and US. Whereas roll-back neoliberalism had seen the privatization of material transport assets and the state's attempt to retract itself from long term commitments to transport subsidization, roll-out neoliberalism marked the commercialization of practices and beliefs around transport relations in which everyday transportation choices were increasingly being commoditized, transport firms were increasingly required to be financially self-sufficient, and where states could pool sums of capital to be used for specific, [allegedly] one-time commercially-viable projects. (2014: 228-229)

The project is overseen by the government-owned company, HS2 Ltd., which is sometimes criticized as a shield behind which the government can hide. As one interviewee explains:

> For the government to spend money before the Act [hybrid bill] was passed would have been illegal. So you create a private company, owned by government – [it's] really not a private company. Takes away accountability [from the government].

Yet, the British government not only provided project funding but also serves as its PR apparatus and facilitates its progress through legal channels. Ever since its inception, state power has been mobilized to make HS2 happen. The project is being enacted through a series of hybrid bills validated by Parliament, starting in 2017. Hybrid bills are promoted and sponsored by the government to support major infrastructure projects deemed to be "of national importance." They grant automatic development consent (planning permission), which authorizes the compulsory purchase of land and land rights – a "*carte blanche* to ignore planning laws" (interviewee). Furthermore, they allow for a range of "ancillary and incidental activities" (Mould, 2017: 3). Similar classifications exist elsewhere, including the Declaration of Public Utility (Déclaration d'utilité

publique) in France or Projects of Common Interest (Proyectos de interés común) in Spain, and facilitate the bureaucratic land grabs mentioned above. This makes them uniquely powerful political tools.

6. 'Levelling up' or profiting the City?

> Every high speed has been sold on the basis that it will spread the wealth… to the other cities. In no case has it ever actually happened. All it's done is to provide a commuter belt for London. (Interviewee)

HS2 is discursively positioned as 'benefitting Northern communities' (McLoughlin, 2015) that have historically been neglected by successive governments. It is meant to feed into the 'Levelling up agenda', a "moral, social and economic programme for the whole of government" (DLUHC, 2022). As HS2 Ltd claim, one of its key drivers and benefits is "Connectivity – catalyzing growth and levelling-up the country":

> HS2 has the potential to change the economic geography of the country and be a catalyst for growth. By bringing Britain closer together, there will be more investment in the Midlands and the North, opening up new leisure and business opportunities for millions of people. (HS2, Connectivity)

The north-south divide, as well as the terrible state of rail travel (especially) in the North of England – what *The Guardian* dubbed a "permacrisis" (2022) – is constantly politically mobilized in HS2 narratives. It is reproduced by the Northern Powerhouse, a government strategy and an alliance of corporate partners that claim to represent northern economic interests and address economic disparities between London and the North. The Northern Powerhouse is sometimes criticized as "a brand, a label which can be applied to often pre-existing policies to give them coherence, focus and portray the government as acting for the North" (in Lee, 2017), or a politically motivated branding exercise.

Yet, an analysis by the New Economics Foundation (NEF) based on HS2's own data has shown that the levelling up narrative doesn't stand up to scrutiny: "40% of the passenger benefits that underpin HS2's economic case will accrue to London"; thus deepening existing regional inequalities, rather than ameliorating them (2019a: 4). The main beneficiaries are the 'City', London's financial hub, as well as wealthy commuters and shareholders (NEF, 2019a; Metz, 2020; Ramchurn, 2013; interviews) – essentially enlarging London's commuter belt by investing in and facilitating access to London. Despite the narrative centering connectivity and levelling up, HS2 "is a striking instance of a project driven from the London-centered heart of Britain's highly centralized government apparatus – for example, there was no local consultation before cancellation of its Leeds link", state Dan Coffey and colleagues (2022: 11).

The unequal benefits are partly due to time savings accruing to the ends of the line, while cities along the line gain little in travel times (Martínez Sánchez-Mateos & Givoni, 2012: 109). Already in 2012, Martínez Sánchez-Mateos and Givoni warned: "Unless there is a careful and strategic consideration of how to link the conventional rail network with the proposed HSR line, the accessibility benefits of the latter (and therefore its wider benefits) are likely to be restricted to the main cities (with a HSR station) and not spill over to nearby cities and regions" (2012: 111). Given plans for further savings in the conventional rail network, this continues to be likely.

In addition to business and other employers in London (including the financial center), the line is likely to primarily benefit wealthy commuters (travelling into the City) and shareholders: "the HS2 demand model forecasts that its average commuting passenger will be in the top 10% of the income distribution" (NEF, 2019b: 6). Campaigners critique that it doesn't make "economic sense": HS2 will "cost taxpayers more than the economic benefits it will deliver" according to government figures (90 pence in economic benefit for every £1 of costs, Diver, 2022). This extends to future investments, thus "intensify[ing] the north-south investment divide", NEF director Andrew Pendleton has argued, making HS2 a "trickle-down transport policy" (in NEF, 2019b). It "redistributes taxpayers' money from the bottom up, benefitting the construction industry, wealthy

commuters, and travelers, as well as the businesses they work for – in the name of sustainability and economic benefits to the North" (Brock & Goodey, 2022: 235-236). The government's own Infrastructure and Projects Authority (IPA) has repeatedly given it the highest risk rating, 'red', which indicates that 'successful delivery' appears to be elusive (e.g. IPA, 2023), and the Institute for Government (2019) has ranked it as a 'poor value project.'

To understand why these unequal costs and benefits are not coincidental but 'inbuilt', it is worth exploring the assumptions underlying the government's claims for HS2's economic benefits and contribution to growth in the North. Britain's industrial strategy is primarily occupied with labor productivity, and the ratio between gross value added (an individual producer, industry, or sector's contribution to GDP) to employment (Coffey *et al.*, 2022) – in other words, how much a job contributes to economic growth. This focus on productivity projects London as a 'role model' and translates into the national 'levelling-up' agenda (*ibid.*: 1). The idea was thus to make the "unproductive" North more like London. Reduced travel times are key to this increase in productivity, because under "travel time is generally considered to be wasted time and a disutility" (Givoni & Banister, 2012: 306).

The focus on productivity stems from the so-called British 'productivity puzzle' (Coffey *et al*., 2022: 1), the long-term and ongoing decline in labor productivity growth in Britain. The 2017 new national industrial strategy (HMG, 2017) thus heavily emphasized productivity as its "unifying theme, with the main organizing parts of the strategy–dealing with ideas, people, infrastructure, business environment and places–designated the 'five foundations of productivity'" (Coffey *et al*., 2022: 2). London became the "reference point for economic performance and high labour productivity … Whereas 'too many' cities in Britain are argued to 'underperform', London for its part is a 'world-leading hub' and a 'magnet 'for' international business and talent'", it was argued (*ibid.*). This is re-emphasized in the government's 2022 levelling-up strategy, which positions London as the productivity leader, suggesting other cities and regions emulate its policies (*ibid.*: 8).

The government ascribes this to 'positive agglomeration effects', essentially economies of scale, and the accumulation of physical, human, financial, and social capitals, innovations, ideas, and patents as well as good institutions and leadership (*ibid.*). However, Dan Coffey and colleagues show that this productivity is the product of a service-based and 'city-economy' that thrives on relatively lower wages, high rents, and house prices (linked to foreign investment in London properties and speculative investments), long commutes, high costs of living, and high rate of self-employment that essentially involve below minimum-wages (2022). They cite the Evidence Base for London's Local Industrial Strategy (2020: 3-4) which stresses that "after deducting housing cost, incomes for the bottom half of London's population lie below the national average, with high incidences of relative poverty, child poverty and food insecurity" (Coffey *et al*., 2022: 10). The government's HS2 policy thus emphasizes productivity for growth, derived from time savings in travel times that are conceptualized as economic benefits, modelled after an extractivist system of lower wages, long commutes, and labor exploitation for economic growth and corporate profits.

7. "A massive money-making machine"? [7]

> This all started with the desire on part of some people to have a rail link between London and the North. Then they also wanted to build another airport… But no one could come up with a good reason why. Apart from "another railway would be nice." (Interviewee)

> An answer that doesn't have a question (Interviewee)

> [The] Decision [for HS2] was made in a policy vacuum. No understanding of what was needed. As a result, all the arguments to support HS2 were engineered after the fact. (Interviewee)

[7] TV presenter Chris Packham (2022).

While a full political economy analysis of HS2 would go beyond the scope of this article, the previous section already hints at what one interviewee has criticized as "massive privatisation of public money" – with profits accruing to corporations, private developers, many with close links to government officials and the conservative party, HS2 staff, commuters, and businesses. The average salary for HS2 workers is over £60,000 (US$76,000) a year (Marshall, 2021), with one in four on a six-figure salary (Sky News, 2018). HS2 executive Mark Thurston earned over £660,000 (US$842,000) in 2019 (Construction News, 2020), making him the government's best paid official (Martin, 2020).

HS2 involves substantive construction and security spending, with large contracts granted to developers. Amongst them are leading developers like Kier, who are also involved in the building of a range of ecologically and socially destructive projects, including new mega prisons and immigration centers. Furthermore, critics state that it has facilitated land grabs by turning previously green land into development land. In turn, this allows for further development that would otherwise not have been possible, especially involving green-belt construction around out of town stations. StopHS2 campaigners write:

> HS2 had been lobbied for by the construction industry, with the additional titbit that we had a Secretary of State for Transport at the time in Philip Hammond who had made his money in housebuilding (though of course when he joined Cabinet his wife took over the shares in his firm, so that's all totally above board), it was becoming clear that HS2 was in part intended to help solve London's housing crisis, and it is simply a fact that more often than not, railway stations lead to developments around them. (2017)

There are numerous examples to back up this claim. In 2017, Sir David Higgins, then HS2 Ltd. Chair, predicted the creation of a "whole new city", Toton, "sandwiched between Nottingham and Derby", and based around a new HS2 train station that "will spark a wave of commercial activity and housebuilding" (Hookham, 2017). While that plan was cancelled in 2021 in favor of East Midlands Parkway, such new developments are already occurring – once land is designated brownfield (through hybrid bills) it is then being used for additional developments. Solihull Council, for instance, has awarded planning permission for Solihull's Urban Growth Company – a "strategic delivery vehicle established to maximize growth opportunities associated with HS2" – to build a £95mil (US$121mil) multistorey car park next to the HS2 Interchange station in the West Midlands (Smith, 2022). In the words of the developers, "By freeing up valuable developable land for more commercial development and housing, they will enable wider plans for the area to provide economic and social benefits for both the region and the UK" (*ibid.*). This is in addition to "key utility infrastructure" in expectation of "new homes" and "high-quality, innovative spaces for working and living" (UGC, 2021). According to HS2's Senior Project Manager for Interchange Station, "HS2's Interchange Station will pave the way for major growth plans in the surrounding area, and we've been working closely with our local partners to design a station that will maximise these future opportunities" (*ibid.*). Councilor Courts of Solihull Council speaks of "up to 3,000 new homes for the borough and up to 6m sq ft of new commercial development" (Crawford, 2020). In Durham, the HS2 project is linked to the development of Aykley Heads business park (Walker, 2017), set in mature parkland (Driver, 2022).

In its *Changing Britain* report, HS2 themselves make promises of more development – "unlocking housing projects" – without the need for additional legislative processes. The Department for Transport promised that HS2 would offer a "boost to housing, jobs and economic growth" (2016), including the regeneration (read: gentrification) at Old Oak and Park Royal ("the prospect of up to 25,500 new homes and 65,000 extra jobs"), in Greater Manchester, and in Leeds (Gov.uk, 2016; Brown, 2022). Other areas include Traffold, North Warwickshire, and greater Birmingham, where housing is being developed in green belt areas (Gilbert, 2017). In anticipation of further development near Birmingham Airport, Railadvent report, "HS2 must have compulsory purchased more land around the Interchange Station… than it needed to build the station" (Smith, 2022). Such dynamics are not new or unique – Fearnside and colleagues have shown in relation to railway construction in Latin America that as land is cleared for railway or other infrastructure projects, other developments tend to follow (2013), leading to further extraction and habitat fragmentation.

Meanwhile, campaigners and residents critique the ongoing local dispossession of farmers and other residents for land acquisition for the railway route – many losing their homes with little compensation. The Parliamentary and Health Service Ombudsman has repeatedly found HS2 Ltd to be "dishonest, misleading and inconsistent" in dealing with residents; and guilty of maladministration in negotiations of family farm owners (Parliamentary and Health Service Ombudsman, 2021). Many accuse HS2 of lying, blackmailing, pressuring, and providing late payments (Parliamentary and Health Service Ombudsman, 2015; StopHS2, 2015, Interviews). Others are refused compensation – a local farming family near Birmingham whose land the HS2 line will cut across, with nearly 1,000 trucks passing by every day for years to come, have been told that they are only "marginally impacted" and thus have no right to compensation, for instance.[8] Those who lose their homes sometimes wait for compensation for years and are pressured not to talk about their case with threats of reduced compensation (interviews). Those with close connections to government officials, however, might benefit from compulsory purchase orders. Stanley Johnson, Prime Minister Boris Johnson's father, received £1mil (US$1.3mil) for land near his home in Euston (Tominey, 2020).

Apart from construction and security firms, many others have concluded profitable agreements with HS2 Ltd – such as the University of Warwick that entertains close relationships with the company (interviews). Interviewees speak of revolving door relationships between HS2, Warwick University Estates, and Glenn Howells architects who are involved in station designs and University development, for instance. The Warwick Arts Centre has secured £250,000 (US$319,000) from the HS2 Community and Environment Fund (CEF) (Warwick University, 2021). Arden Cross Ltd – an economic development project and self-proclaimed "global destination for innovation, business, learning and living" – signed a Memorandum of Understanding with the University of Warwick to explore the creation of a new Medical and Technology Campus as part of the £3.2bn (US$4.1bn) Arden Cross development around new HS2 Interchange station (Warwick University, 2022). Their relationship is worthy of further research.

To sum up, the HS2 development not only leads to dispossession and land grabs along the line, but also the effective privatization of public land into the hands of development corporations, such as the OPDC, a mayoral development corporation – already pointing to some of the winners and losers of the project. "High-speed railway projects' green extractivist nature", we have argued elsewhere, "lies not only in their function within the broader political economy, but also in their role in the extraction of value from regions, places, and spaces, by connecting them (as in the case of HS2) with bigger markets, financial centres, economic hubs, and airports, in the name of sustainability" (Brock & Goodey, 2022: 235). It illustrates that HS2 is concerned with mobility not to connect people and communities, but mobility in the service of capital. This mobility and the drive for profits and growth through extractive infrastructures are key to ongoing infrastructural colonization and to secure state power.

8. "Zero carbon rail travel for a cleaner, greener future" (HS2, Carbon)?

The government and HS2 Ltd. have framed HS2 as a 'green' project, a narrative grounded in the promise of "zero carbon rail travel for a cleaner, greener future" (2022; Figure 2) with net-zero carbon targets (through carbon offsetting from 2035), no-net loss of biodiversity targets (through biodiversity offsetting), and the promise of 'modal shifts' from roads and flights to more rail travel. The evidence for these claims is very mixed, as in-depth research by activists including numerous FOI requests have illustrated. This section dissects claims about the climate benefits and ecological credentials of HS2, starting with 'modal shifts', followed by carbon-neutrality claims, and impacts on (forest) ecosystems. It is these narratives that are key to the state-extraction-ecocide nexus introduced above.

[8] Personal conversation, August 2021.

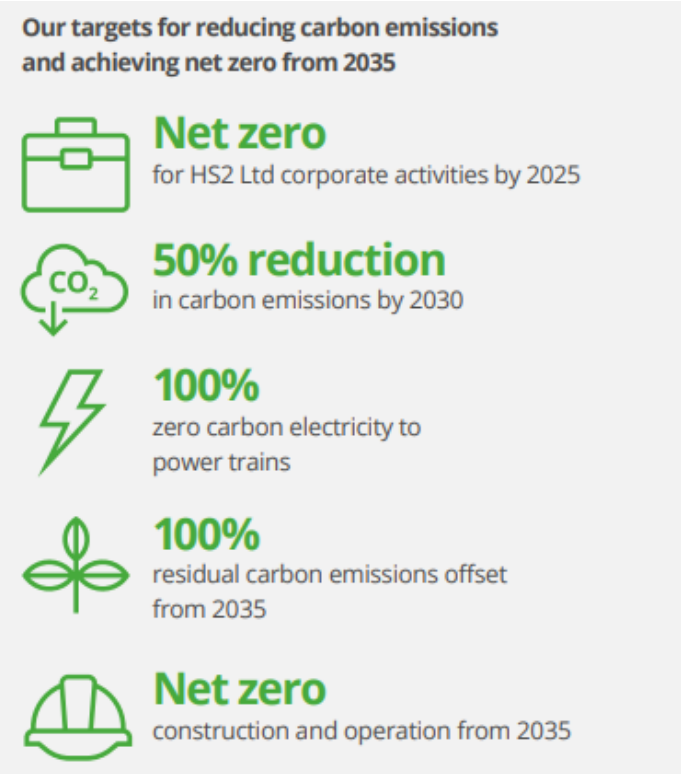

Figure 2: Net Zero Carbon Plan (HS2, 2022)

Essential to HS2's green narrative are claims that HS2 rail traffic will lead to lower numbers of internal and short haul flights and road use. The evidence base for these statements is thin, drawing on experiences with high-speed rail abroad and modelling specifically related to HS2. In theory, high speed rail can lead to significant modal changes – while we are lacking comprehensive data, it *can* result in "significant-to-dramatic mode shifts" (Haas, 2014: 1). Positive examples cited for these shifts are usually intra-European city connections as well as a small number of routes in Spain and France (for instance Bleijenberg, 2020). The UK's only existing high-speed rail connection to Brussels/Paris, according to the High Speed Rail Group (HSRG, 2022), reduced air passenger volumes by 50-60%. In Italy, Mattia Borsati and Daniel Albalate conclude, "neither HSR [high-speed rail] openings nor the opening of on-track competition led to a modal shift from motorway to HSR services, as the two transport modes are non-competing. Conversely, HSR expansion had a slightly positive impact on motorway traffic" (2020: 145). Indeed, high-speed rail often plays a "complementary" role to connect European travelers with major airports (Coogan in Haas, 2014). Yet, it is difficult to extract from these examples: "Forecasts of demand for specific HSR routes or systems—with and without estimates of mode shift to HSR—have been criticized for being generally inaccurate and systematically higher than subsequent ex post data would indicate" (Haas, 2014: 8). Indeed, often studies of the long-term social, ecological, and economic benefits of high-speed rail investments "suffer from a form of tunnel vision in which the decision to go ahead with the project becomes the 'raison d'être' for the study in the first place" (Katz-Rosene, 2014: xvi).

Specifically in relation to HS2, the expected modal shifts are modest, although reliable data is lacking. The Department for Transport suggests that only 1% of HS2 passengers will be people who would have flown otherwise, and 4% who would have driven (Gov.uk, 2013, confirmed in UK Parliament, 2019). Over 85% of passengers are expected to be existing railway users or new passengers. That means that most passengers would have otherwise not travelled or used more sustainable (lower-speed) alternatives, unless HS2 was fully

electrified and run off significantly lower-carbon energy sources. While the High Speed Rail Group maintained that "Rail's share of the London-Scotland travel market could leap from 29% to 75% if, alongside HS2, services are speeded up north of Crewe" (HSRG, 2022), it has become clear that these conditions will not be met, as the Northern part of the project has been cancelled (no faster links to Scotland beyond Birmingham, as of 2024) and investment into conventional rail infrastructures continues to be cut. In addition to a better connection to Scotland, substantive shifts from plane to train for inner-European routes would require a direct link between HS1 and HS2 (Hakimian, 2022). Not only does the route potentially end in London Euston if funding is found, rather than the HS1 terminal at St. Pancras International, but that leg of the route is not expected to be finished until the early 2040s, initially only terminating Old Oak Common in North London. To sum up, significant modal shifts from aviation are unlikely.

Shifts from road transport seem to be equally uncertain, with many interviewees and commentators emphasizing the need for more inner-North connections and investments into the connectivity *between* cities in the North and the Midlands. Some studies even warn of *more* car travel, as HS2 might lead to further deterioration of local networks and quality of rail transport on the conventional rail network (Martínez Sánchez-Mateos & Givoni, 2012). The planned cuts testify to these predictions. The overly optimistic narratives around modal shifts are partly due to the focus on maximum speed alone: "Passengers are not necessarily concerned with the station-to station travel time when deciding on their mode choice but the door-to-door travel time. [Our analysis] suggested that for many in the UK a new HSR line will result in similar or longer door to-door rail journey (to London)" (*ibid.*: 114). This is exacerbated by poor integration with conventional rail services (*ibid.*) and continued cuts to their budgets. While other studies, often linked to the Department for Transport, Greengauge 21 (a pro-high speed rail body), or railway industries come to different conclusions, even the High Speed Rail Group (2022) argued that high speed railways would have to extend much beyond Birmingham to Edinburgh and Glasgow for people to shift from domestic flights and car travel (Stone, 2022).

Before the Covid-19 epidemic, Britain's rail network was operating at full capacity, and HS2 Ltd. promote that they would add extra capacity and increase freight transport as trains are taken off slower routes. Again, evidence is mixed and partly speculative.

> By moving long-distance traffic from current rail infrastructure onto the new high-speed line, HS2 would create the extra room needed to improve local and inter-regional services … [and] for 144 extra freight trains per day, which could carry over 2.5 million lorries' worth of cargo each year. (Global Railway Review 2019: see also HSRG, 2022)

Critics argue that the numbers are misleading (and outdated) and that additional capacity for freight is minimal. This is partly because existing long-distance rail connections are still needed to connect cities not on the HS2 line, thus not benefiting freight. "The amount of additional train path capacity that HS2 brings to the North of England is pretty much zero", Chris Stokes, former British Rail director at British Rail and an executive director at the Strategical Rail Authority, stated at the House of Lords Economic Affairs Committee (Stokes at House of Lords, 2019). Joe Rukin from StopHS2 has argued that "adding new services by 'freeing up capacity' is incompatible with the HS2 business case which specifically expects a net cut of £11.1bn [US$14.2bn] to existing rail services" (2019). Some argue HS2 might even "make freight slower and less attractive" (see StopHS2, 2019b) because existing long-distance trains are still needed, and the HS2 route is not connected to any ports that are relevant for freight (such as Liverpool). More recent cuts to the planned route further undermine any increases in freight capacity (Stokes, 2023).

Connecting airports and carbon neutrality claims

Potential carbon 'gains' through fewer domestic flights might be offset negatively by making trips to take and return from long haul flights more accessible (according to the British Airports Authority), increasing emissions by several times (Ends report, 2011). The StopHS2 coalition has argued that "[i]t is important to note that while some saw HS2 as an alternative to a third runway at Heathrow, it was never meant to be an alternative to the expansion of aviation. HS2 was – and still is – meant to drive the expansion of airports by making them

more accessible and connecting them together" (2019a). Indeed, several Northern airports were expanding their capacity in response to HS2 development (Business Live, 2013). Birmingham airport, for instance, "has announced that it will market itself as a fourth London airport with HS2 as the link. The airport said it is currently running at 40% of its capacity and could take 9m extra passengers a year. Birmingham Airport's expansion plans will double the number of flights, resulting in increased emissions" (*ibid*.). "High Speed Rail has been at the core of our sales pitch to airlines. It will bring Birmingham Airport 'closer' to London than Luton and Stansted", according to Paul Kehoe, chief executive of Birmingham Airport (2017). It thus doesn't come as a surprise that airports are actively lobbying for HS2 (StopHS2, 2019b; Savage, 2019).

Apart from well-known fundamental flaws with the very idea of carbon neutrality (including its reliance on offsetting), many have critiqued HS2's misleading carbon neutrality claims, which, according to the company's own estimates, will take over 120 years to achieve (The Times, 2020). HS2 themselves criticize this number as "outdated" (HS2, *Twitter*), ignoring updated modal shifts, underestimating freight transfers from lorries to rail, and reduction of carbon from construction. Maybe in response to critics, HS2 Ltd. therefore announced 'zero carbon electricity' (which is itself a myth due to embedded emissions in electricity generation even from lower-carbon electricity sources, see Dunlap, 2021b), but not provided any details about its sources of electricity. Yet, its own 2021 assessment confirms that even after 120 years, HS2 will have produced a net increase in greenhouse gas emissions (HS2, 2021c).

Having explored its carbon impacts, the next section moves on to analyze HS2's wider ecological destructive consequences which go much beyond a narrow carbon (reductionist) focus.

Destruction of ecosystems

Much resistance against HS2 is triggered by its destructive impacts on biodiverse ecosystems – initially expected to negatively affect 108 ancient woodlands[9] – destroying irreplaceable nature reserves, chalk aquifers, and waterways (Woodland Trust, *HS2 Rail Link*). Land defenders have long pointed to the destruction of diverse habitats, ancient woodlands, and areas of natural beauty including greenbelt land for construction sites and 'enabling works': spur roads, temporary access roads, roads to the new developments, new stations, and car parks. HS2 Ltd. refused to disclose the number of miles of access roads that are being built for construction – campaigners speculate that this might be because they add up to more than the planned number of miles of train tracks (interviews). In 2020, the Wildlife Trusts (2020) warned that 33 Sites of Special Scientific Interest and 21 Local Nature Reserves were at risk of destruction and close to 700 Local Wildlife Sites set to be part-damaged or destroyed by the HS2 route. The initial designs, StopHS2 campaigners pointed out in 2017, were intended for the width of the line, including 'vegetation free zones' (VFZs) on both sides, to be 75 meters wide, wider than "six lanes of road" (StopHS2, 2017). These VFZs were later reduced to 21m each and "renamed to something which sounded a little less like bare concrete… specifications of the footprint of HS2 disappeared from later documents" (*ibid.*).

This 'unavoidable damage' is meant to be 'offset' through the planning of new trees and the translocation of animals and habitats.[10] Several initiatives, including the 'Green Corridor Prospectus' are to mitigate impacts; to "create a network of bigger, better-connected, climate resilient habitats and new green spaces for people to enjoy", "add[ing] benefit over and above committed mitigation and statutory compensation" (HS2 Ltd, 2020). For the second phase of the project, HS2 Ltd. claims to move from *No Net Loss* and towards *Net Gains* of biodiversity (Stephenson, 2021). While unable to replace ancient woodlands, such offsetting projects are important mechanisms for the discursive greening of extractive projects (Brock, 2020a).

Land defenders and ecologists have further recorded numerous – legal and illegal – instances of local ecological destruction of (drinking) water sources, woodlands, rare bat habitats[11], and bird nests (in contravention of the Wildlife and Countryside Act 1981), including with video evidence (The Independent, 2020). Campaigners have reported that HS2 Ltd. intentionally drive out wildlife before surveys. One

[9] With the cancellation of one part of the project, the number is now lower and currently being recalculated.
[10] For critiques of biodiversity offsetting, see Carver & Sullivan (2017); Hannis & Sullivan (2012) and Brock (2020b).
[11] Between August and November 2020, 1,600 tonnes of bentonite, a pollutant, was lost into the chalk aquifer at the Chalfont St Peter vent shaft work site. For more details see HS2's own report (Align, 2021).

interviewee recounts: "[There was an] ecologist coming this morning to verify birds. Just before he arrived, [there were] 3 vans… [with] back doors open, speakers and loud music [to disperse the birds]." The National Trust, a charity and membership group for nature and heritage conservation (historically close to the establishment) has critiqued HS2's limited approach to reporting as underestimating development impacts, particularly in respect to connectivity and consequent impacts upon movements of species. In its 2016 response to the HS2 Phase 2A Environmental Impact Assessment and Scope and Methodology Report (SMR), the National Trust criticized:

> The proposed habitat surveys have some significant omissions, such as the consideration of veteran trees, brown hare and deer. Habitat connectivity mapping and modelling, using the method recommended by the HS2 Ecology Technical Group, should be incorporated into the EIA and we would like to see a programme of proactive monitoring of the significant residual impacts of the scheme. (National Trust, 2016)

This already points to structural flaws in HS2's environmental impact assessments. To compensate for the loss of ancient woodland and other habitats, HS2 Ltd. has pledged to plant 130 hectares of new habitat and 90 hectares of restored ancient woodland habitat, as well as new ponds, grasslands, and meadows (Mann, 2022). This includes HS2's 'Green Corridor', expected to run alongside the railway, to connect habitats and green areas. Yet, their biodiversity work is critiqued not only for the use of inadequate measurement tools, but also for the lack of environmental 'aftercare', which has already led to the death of entire new tree plantations (interviews, Leamington Observer, 2019).

Tree offsets are a continuation of the extractivist mindset of the 'plantation' that is linked to the civilizing mission of modernity, and points to the ways offsetting acts as social technology of governance to manage resistance (Brock, 2019) and the environmental imaginaries that corporate and state forces impose, defend, and profit from (Samiee, 2022; Yao, 2022). These are grounded in zero-carbon imaginaries, high-speed mobility, and the fungibility of ecosystems. Extractive infrastructures such as HS2 embody these assumptions and "bind the state-extraction-ecocide nexus together" (Brock, 2020a: 3). Framed as sustainable and part of a green transition, they continue the same extractive logics and processes that are part of capitalist modernity and the march for 'progress', strengthening state power and statist imaginaries of green capitalism.

9. Conclusion

> This is all just neo-colonialism again. (interviewee)

This provocative statement represents the feelings of many people who resist HS2. They critique the imposition of a megaproject as neocolonial, in a country that had to be colonized and pacified internally before it could become the imperial power that spread colonialism, genocide, and ecocide abroad. This points to the ongoing infrastructural colonization (Dunlap, 2021a) that extractivist projects can (re)produce – extracting value through ecological and social destruction, fragmentation, and exploitation. Green or otherwise, extractivist projects are closely tied to state power and thus enforced at all costs (Meehan, 2014). They profit capitalist and state interests, often at the expense of local people and ecosystems.

In this article, I embedded the UK's HS2 project in the colonial history and contemporary political economy of British railways. This history involves the expansion of railways for extraction from and deindustrialization abroad, and accumulation of profits and industrialization at home. Their more recent history is one of privatization, decay, and neglect, a government-incentivized drive for competitiveness and efficiency that encourages staff cuts to save costs and break unions, with foreign ownership and huge debts.

Investment into HS2 does not break with this history. Though the lenses of extractivism, infrastructures, state power, and infrastructural colonization, and mobilizing an (anarchist) political ecology approach, I argued that HS2 constitutes a green extractivist megaproject that contributes to capital accumulation and exploitation at the cost of human and ecological health. As interviewees emphasized: this is not about a trainline. Instead it

is a financial project that is expected to benefit (the City of) London, capital, the construction industry, and wealthy commuters, and it was to extract value and labor from the North of the UK, facilitating dispossession and ecological destruction along the route. While framed as contributing to the 'levelling up agenda', it is grounded in the drive to increase labor productivity by making the North 'a bit more like London.' London's relatively higher productivity, however, is the product of exploitation and extraction of workers; low wages, long commutes, and unaffordable rents.

The framing as zero-carbon, to be achieved through offsets, electrification, and 'renewable' energy, is mobilized to paint the project as sustainable and part of the government's climate commitment, but ignores the ecological destruction along the route, the impossibility of compensating for the destruction and fragmentation of unique ecosystems including ancient woodlands, and its huge carbon footprint. Infrastructural coloniality, Dunlap has argued, "frequently results in 'selling out' ecosystems/habitats, thereby subordinating non-human life (e.g. animals, rivers, mountains, trees and habitats) to the desires of various human populations under the influence of colonial mentalities and, later, industrial-'technocapitalist' desires" (Dunlap, 2023) – including carbon-reductionist climate change targets. Infrastructural colonization through green extractivism creates human and ecological sacrifice zones under the pretense of sustainability and growth. These sacrifice zones are in no way comparable to those created by railways construction in colonial India, or the extraction of resources for green technologies across the global South today. Yet, they merit attention.

Extractive infrastructures are not only important for state building and state legitimacy, but also for the pacification and domestication of subjects – whether we look at early water infrastructures and their importance to the very first state-building exercises and emergence of social hierarchy (Gelderloos, 2017), or the importance of 'lower-carbon' energy infrastructures to the legitimation of 'green' capitalism and pacification of ecological resistance. They are key in shaping people's direct relationships with each other and with their environment (Rodgers & O'Neill, 2012) and in forming, reinforcing and extending the "life of colonial-statist structures", and spreading 'green' infrastructural harm (Dunlap, 2021a: 19).

These infrastructures are frequently resisted by people on the ground, who see the relationship between social and ecological oppression and the imposition of unwanted megaprojects that won't benefit them. Taking their experiences seriously, and learning from recent (anarchist) political ecology critiques of megaprojects and (green) extractivism, helps challenge the "infrastructural coloniality" (Dunlap, 2021a: 6) inherent to many critical approaches that uphold the "supremacy of modernist infrastructures over ecosystems" (Dunlap, 2023). Instead, it shows how green extractivist megaprojects can reproduce the same injustices, violences, and social and ecological harms as other types of industrial developments.

The argument here is not that railways are inherently bad, or to deny any potential benefits of high-speed railways. Instead, I aim to show the role they can play in upholding and entrenching extractivist and colonial/statist dynamics in industrial society. Examining HS2 as extractivist (or 'ecological fix', Katz-Rosene) helps "unpack the underlying motives of the sustainable bullet train construct and highlight the conditionality involved in the technology's true socio-ecological impacts" (2014: 14). It "reminds us that there are a range of underlying motivations for [highs-speed rail] development, and that often the sustainability argument is typically undergirded by a deeper motivation of creating profitable opportunities for the private sector" (*ibid*.: 303).

Katz-Rosene urges us to ask: "Will [high-speed] trains primarily be designed as a means of creating growth in intercity travel and gross domestic product – or will transportation initiatives be unveiled as part of a larger cultural and regulatory program *to reduce the overall volume of transport consumption*?" (2014: 204). As expected, no such policies are on the table – HS2 is part of a program to *drive* growth and productivity, and even if HS2 was facilitating ecological 'gains', these would likely be quickly outdone by the "net growth in overall mobility" (*ibid.*). The UK's (lack of) serious climate and ecological policy – indeed, its current dismantling – illustrate why concern is warranted.

The case study shows that sustainable transport is not about technological change, 'net number of trees', or 'net carbon emissions' – all too often, climate mitigation efforts legitimize ecosystem destruction and green grabbing, not challenging the wider ecocidal power structures within which they are embedded and which force people to commute long distance to sell their labor, and incentivize the import of products from far away. It is also not just about 'modal shifts' – indeed, modal shifts are meaningless if the overall amount of transport

continues to grow. 'Sustainable' transport is about the social relations and political economic patterns within which it is embedded, about control and power, about who decides who travels, where, how, and why. It raises questions of ownership and decision making.

Many are currently arguing for bringing rail services back into public ownership, to eliminate shareholder pay-outs, and to use earnings to improve services and reduce fares, in other words to "replac[e] the for-profit structure of the rail services, [with] a new de-financialised structure of incentives… to meet social, economic and environmental needs" (Brett & Buller, 2020). Others advocate for the electrification of existing railways as well as free local public transport. A radical remaking of transport would reject the 'airworld' of frictionlessness', speed, productivism, and growth, and the extractivism they entail altogether. It would challenge contemporary relations of mobility and production, long-distance trade, and the system of exploitation of labor and ecosystems they are grounded in, instead supporting localization and community control or 're-commoning.' This would help build up a transport system that truly served human and ecological needs, not the interests of corporations, states, or empires.

Bibliography

Acosta, A. (2013). Extractivism and neoextractivism. In Lang, M. & Mokrani, D. (Eds.) *Beyond development*. Rosa Luxemburg Foundation. https://www.rosalux.de/publikation/id/8051/beyond-development/

Armano, E., Luca Pittavino, G., Sciortino, R. (2013). Occupy in Valsusa: The No TAV Movement. *Capitalism Nature Socialism*, 24(2), 14-26. https://doi.org/10.1080/10455752.2013.789328

Bagchi, A. K. (1982). *The political economy of underdevelopment*. Cambridge University Press.

BBC (2018). Mexico launches $7.4bn Tren Maya railway project https://www.bbc.co.uk/news/world-latin-america-46588042

Beckert, S. (2014). *Empire of cotton: A new history of global capitalism*. Allen Lane.

Bleijenberg, A. (2020). Air2Rail. Study commissioned by the European Federation for Transport and Environment. https://www.transportenvironment.org/wp-content/uploads/2021/07/2020_03_Air2Rail_Koios_strategy_rev.pdf

Borsati, M. & Albalate, D. (2020). On the modal shift from motorway to high-speed rail: Evidence from Italy. *Transportation Research Part A: Policy and Practice*, 137, 145-164. https://doi.org/10.1016/j.tra.2020.04.006

Brett, M. & Buller, A. (2020). Signal and Switch: Toward a more resilient rail system for the UK. Commonwealth. https://www.common-wealth.co.uk/publications/signal-and-switch-toward-a-more-resilient-rail-system-for-the-uk

Brock, A. (2019). *Conserving ~~nature~~ power: Exploring biodiversity offsetting in Europe and beyond*. PhD dissertation, University of Sussex.

Brock, A. (2020a). 'Frack off': Towards an anarchist political ecology critique of corporate and state responses to anti-fracking resistance in the UK. *Political Geography*, 82, https://doi.org/10.1016/j.polgeo.2020.102246

Brock, A. (2020b). Securing accumulation by restoration – exploring spectacular corporate conservation, coal mining and biodiversity compensation in the German Rhineland. *Environment and Planning E: Nature and Space*. https://doi.org/10.1177/2514848620924597

Brock, A. & Dunlap, A. (2018). Normalising corporate counterinsurgency: Engineering consent, managing resistance and greening destruction around the Hambach coal mine and beyond. *Political Geography*, 62, 33-47. https://doi.org/10.1016/j.polgeo.2017.09.018

Brock, A. & Goodey, J. (2022). Policing the High Speed 2 (HS2) train line – repression and collusion along Europe's biggest infrastructure project. In Dunlap, A. & Brock, A. (Eds.) *Enforcing Ecocide: Power, policing & planetary militarization*. Palgrave.

Brock, A. & Stephens-Griffin, N. (2021). Policing environmental injustice. *IDS Bulletin*. https://opendocs.ids.ac.uk/opendocs/handle/20.500.12413/16915

Brown, C. (2022). Plan for 25,000 new homes near HS2 'super-hub' gets go-ahead. *Housing Today*. https://www.housingtoday.co.uk/news/plan-for-25000-new-homes-near-hs2-super-hub-gets-go-ahead/5118106.article

Burballa-Noria, A. (2018). Environmental justice claims and dimensions in anti-megaproject campaigns in Europe. In Apostolopoulou, E. & Cortes-Vazquez, J. A. (Eds.) *The right to nature*. (pp. 155-167). Routledge.

Carver, L. & Sullivan, S. (2017). How economic contexts shape calculations of yield in biodiversity offsetting. *Conservation Biology*, 31(5), 1053-1065. https://doi.org/10.1111/cobi.12917

Chagnon, C. W., Hagolani-Albov, S. E. & Hokkanen, S. (2021). Extractivism at your fingertips. In Shapiro, J. & McNeish, J.-A. (Eds.). *Our extractive age: Expressions of violence and resistance.* (pp. 176-188) Routledge.

Channon, G. (2001). *Railways in Britain and the United States, 1830-1940.* Routledge.

Chimee, I.N. (2014). Coal and British colonialism in Nigeria. *RCC Perspectives*, 5, 19-26. http://doi.org/10.5282/rcc/6556

Coffey, D., Thornley, C. & Tomlinson, P. R. (2022). Industrial policy, productivity and place: London as a 'role model' and High Speed 2 (HS2). *Regional Studies*, 57(6), 1171-1183. https://doi.org/10.1080/00343404.2022.2110226

Crawford, R. (2020). At boiling point. *Solihull Observer* https://solihullobserver.co.uk/news/at-boiling-point-alarm-raised-over-arden-cross-development/

Cruz, M. & Luke, D. (2021). Methodology and academic extractivism: The neo-colonialism of the British university. In Morreira, S., Luckett, K., Kumalo, S. H. & Ramgotra, M. (Eds.). *Decolonising curricula and pedagogy in higher education*. Routledge.

Das, P. (2011). Colonialism and the environment in India: Railways and deforestation in 19th Century Punjab. *Journal of Asian and African Studies*, 46(1), 38-53. https://doi.org/10.1177/0021909610388015

DfT (Department for Transport) (2021a). HS2 6-monthly report to Parliament: March 2021. https://www.gov.uk/government/speeches/hs2-6-monthly-report-to-parliament-march-2021

DfT (2021b). Great British railways: Williams-Shapps plan for rail. https://www.gov.uk/government/publications/great-british-railways-williams-shapps-plan-for-rail

Diver, T. (2022). HS2 will cost taxpayers more than the economic benefits it will deliver, Government admits. *The Telegraph*. 11 Dec. https://www.telegraph.co.uk/politics/2022/11/12/hs2-will-cost-taxpayers-economic-benefits-will-deliver-government/

DLUHC (2022). Policy paper: Levelling up the United Kingdom. https://www.gov.uk/government/publications/levelling-up-the-united-kingdom

Driver, M. (2022). Investing for the future. https://www.ukreiif.com/investment-news/investing-for-future/

Dunlap, A. (2018). The 'Solution' is now the 'Problem:' Wind energy, colonization and the 'Genocide-Ecocide Nexus' in the Isthmus of Tehuantepec, Oaxaca. *The International Journal of Human Rights*, 42(4), 550-573. https://doi.org/10.1080/13642987.2017.1397633

Dunlap, A. (2021a). Spreading 'green' infrastructural harm: Mapping conflicts and socio-ecological disruptions within the European Union's transnational energy grid. *Globalizations*, 20(6), 907-931. https://doi.org/10.1080/14747731.2021.1996518

Dunlap, A. (2021b). Does Renewable Energy Exist? Fossil Fuel+ technologies and the search for renewable energy. In Batel, S. & Rudolph, D. (Eds.) *A critical approach to the social acceptance of renewable energy infrastructures: Going Beyond Green Growth and Sustainability*. (pp. 83-102). Palgrave Macmillan. https://doi.org/10.1007/978-3-030-73699-6_5

Dunlap, A. (2022). 'I don't want your progress! It tries to kill… me!' Decolonial encounters and the anarchist critique of civilization. *Globalizations*, 1-27. https://doi.org/10.1080/14747731.2022.2073657

Dunlap, A. (2023). The structures of conquest: Debating extractivism(s), infrastructures and environmental justice for advancing post-development pathways. *International Development Policy*, 16, https://doi.org/10.4000/poldev.5355

Dunlap, A. & Brock, A. (2021). When the wolf guards the sheep. The Industrial Machine through Green Extractivism in Germany and Mexico. In Mateer, J. *et al*. (Eds.) *Energies beyond the state: Anarchist political ecology and the liberation of nature*. (pp. 91-123). Rowman & Littlefield.

Dunlap, A. & Correa-Arce, M. (2022) 'Murderous energy' in Oaxaca, Mexico: Wind factories, territorial struggle and social warfare. *The Journal of Peasant Studies*, 49(2), 455-480. https://doi.org/10.1080/03066150.2020.1862090

Dunlap, A. & Riquito, M. (2022). Social warfare for lithium extraction? Open-pit lithium mining, counterinsurgency tactics and enforcing green extractivism in northern Portugal. *Energy Research & Social Science*, 95, 102912 https://doi.org/10.1016/j.erss.2022.102912

Dunlap, A. & Tornel, C. (2023). An insurrection in energy research: a dialogue between Carlos Tornel and Alexander Dunlap on energy justice, capitalist warfare & decolonization. *Globalizations*, DOI: https://doi.org/10.1080/14747731.2023.2204543

Dunlap, A., Verweijen, J. & Tornel, C. 2024. The political ecologies of "green" extractivism(s): An introduction. *Journal of Political Ecology*, 31(1), 436-463. http://doi.org/10.2458/jpe.6131

Ends report (2011). High-speed rail set to boost UK emissions from aviation. https://www.endsreport.com/article/1564839/high-speed-rail-set-boost-uk-emissions-aviation

Engel-Di Mauro, S. (2013) Introduction to the symposium: Hints of post-capitalist prefiguration in Val di Susa (NW Italy). *Capitalism Nature Socialism*, 24(2), 7-13. https://doi.org/10.1080/10455752.2013.789210

European Commission (2021). New transport proposals target greater efficiency and more sustainable travel. Press release. https://ec.europa.eu/commission/presscorner/detail/en/ip_21_6776

Evidence Base for London's Local Industrial Strategy (2020). The evidence base for London's local industrial strategy – Final report. GLA Economics, Greater London Authority (GLA). https://www.london.gov.uk/business-and-economy-publications/evidence-base-londons-local-industrial-strategy-final-report

Fearnside, P. M., Figueiredo, A. M. & Bonjour, S. C. (2013). Amazonian forest loss and the long reach of China's influence. *Environment, Development and Sustainability*, 15(2), 325-338. https://doi.org/10.1007/s10668-012-9412-2

Foot, T. (2021). Greens split over whether to now support HS2 rail line. *Camden New Journal*, https://www.camdennewjournal.co.uk/article/greens-split-over-whether-to-now-support-hs2-rail-line.

Gellert, P. K. & Lynch, B. D. (2003). Mega-projects as displacements. *International Social Science Journal*, 55(175), 15-25. https://doi.org/10.1111/1468-2451.5501002

Gilbert, S. (2017). Plan for new town on green belt near Birmingham Airport. BirminghamLive https://www.birminghammail.co.uk/news/midlands-news/plan-new-town-green-belt-13511124

Givoni, M. & Banister, D. (2012). Speed: The less important element of the High-Speed Train. *Journal of Transport Geography*, 22(5), 306–307. https://doi.org/10.1016/j.jtrangeo.2012.01.024

Global Railway Review (2019). Analysis reveals capacity-releasing effects of HS2. https://www.globalrailwayreview.com/news/89694/hs2-capacity-britains-existing-rail/

Glover, J. & Milmo, D. (2009). Make do and mend: How Britain neglected its railways. *The Guardian*. 5 Aug. https://www.theguardian.com/politics/2009/aug/05/railways-britain-neglect-trains

Gov.uk (2016). From London to the north, HS2 offers boost to housing, jobs and economic growth. https://www.gov.uk/government/news/from-london-to-the-north-hs2-offers-boost-to-housing-jobs-and-economic-growth

Grosfoguel, R. (2020). Epistemic Extractivism. In Santos, B. & Meneses, M. P. (Eds.) *Knowledges born in the struggle: Constructing the epistemologies of the Global South*. (pp. 203–218). Routledge.

Guardian (2022). The Guardian view on rail travel in the north: Taking the public for a ride. I Nov. https://www.theguardian.com/commentisfree/2022/nov/01/the-guardian-view-on-rail-travel-in-the-north-taking-the-public-for-a-ride?CMP=Share_iOSApp_Other

Guardian (2023) HS2 Euston tunnellers given suspended sentences after retrial. Aug. 1. https://www.theguardian.com/uk-news/2023/aug/01/hs2-tunnel-protesters-euston-sentenced-retrial

Gudynas, E. (2018). Extractivisms: Tendencies and consequences. In Munck, R. & Delgado Wise, R. (Eds.) *Reframing Latin American development*. (pp. 61-76). Routledge.

Haas, P. (2014). Modal shift and High-Speed Rail: A review of the current literature. *MTI Report*. https://transweb.sjsu.edu/sites/default/files/1223-modal-shift-high-speed-rail-literature-review.pdf

Haines-Doran, T. (2022). *Derailed: How to fix Britain's broken railways.* Manchester University Press.

Hamilton, D. & Trölenberg, S. (2023) 'We are nature defending itself'—The Forest of Dannenrod occupation as an example of contested extractivism in the Global North, *International Development Policy | Revue International de politique de développement*, 16. https://doi.org/10.4000/poldev.5394

Hannis, M. & Sullivan, S. (2012). *Offsetting Nature? Habitat banking and biodiversity offsets in the English land use planning system*. Technical Report. Green House.

Hakimian, R. (2022). Link between HS1 and HS2 is key to switching UK travellers from plane to train. *New Civil Engineer*. 13 May https://www.newcivilengineer.com/latest/link-between-hs1-and-hs2-is-key-to-switching-uk-travellers-from-plane-to-train-13-05-2022/

Hesketh, C. (2021). Clean development or the development of dispossession? The political economy of wind parks in Southern Mexico. *Environment and Planning E: Nature and Space*, 5(2), 543–565. https://doi.org/10.1177/2514848621991764

HMG (HM Government) (2017). *Industrial strategy: Building a Britain fit for the future*. Department for Business, Energy and Industrial Strategy (BEIS). https://www.gov.uk/government/publications/industrial-strategy-building-a-britain-fit-for-the-future

Hookham, M. (2017). Next arrival on the HS2 line. *The Times*. https://www.thetimes.co.uk/article/next-arrival-on-the-hs2-line-a-brand-new-city-xp2kg2g3z

Hordan, R. (2021). Need for Northern Powerhouse Rail laid bare as Britain's worst connected cities revealed. *New Civil Engineer*. 11 Nov. https://www.newcivilengineer.com/latest/need-for-northern-powerhouse-rail-laid-bare-as-britains-worst-connected-cities-revealed-11-11-2021/0020

HSRG (High Speed Rail Group), 2022. *Modal shift matters – and HS2 delivers it.* https://www.rail-leaders.com/wp-content/uploads/Modal-shift-matters-landscape-version.pdf

HS2 Ltd. (2021a). Carbon—Putting Britain on track to a net zero carbon future. https://www.hs2.org.uk/why/carbon/

HS2 Ltd. (2021b). 'We're taking an extra 24,000 lorries off Buckinghamshire roads…' https://twitter.com/HS2ltd/status/1425056856599371787?s=19

HS2 Ltd. (2021c) High Speed Two Phase 2a Information Paper. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/960807/E27_Carbon_v1.3.pdf

HS2 (n.d.) *Changing Britain.* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/563677/CS567_Changing_Britain_2_WEB.pdf

HS2 (n.d.). *Carbon.* https://www.hs2.org.uk/why/carbon/

HS2 (n.d.). *Twitter*. By 2050. https://twitter.com/hs2ltd/status/1363830349189496837

HS2 (n.d.). Connectivity. https://www.hs2.org.uk/why/connectivity/

HS2 (2022). Net Zero Carbon Plan: A cleaner, greener future, January 2022 https://assets.hs2.org.uk/wp-content/uploads/2022/01/25357_HS2_NetZeroCarbonPlan_CS1656_Final_InteractiveWeb_Accessible.pdf

Hornborg, A. (2003). The unequal exchange of time and space: Toward a non-normative ecological theory of exploitation. *Journal of Ecological Anthropology*, 7(1), 4-10. http://dx.doi.org/10.5038/2162-4593.7.1.1

IPA (2023). Annual Report on major projects 2022-23. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1175756/IPA-Annual-report-2022-2023.pdf.pdf

Jakobsen, L. J. (2020). Corporate security technologies: managing life and death along a Colombian coal railway. *Political Geography*, 83, 102273. https://doi.org/10.1016/j.polgeo.2020.102273

Jaiswal, S. (2018). Looking beyond the idyllic representations of the rural: the Konkan Railway controversy and middle-class environmentalism in India. *Journal of Political Ecology*, 25(1), 261-278. https://doi.org/10.2458/v25i1.22046

Jones, R. (2017). *The Nation's Railway: Birth, Beeching and beyond.* Morton's Media Group.

Karakuu, M. (2019) *Empire's Tracks.* University of California Press.

Katz-Rosene, R. (2014). *Turbotrain, Zerotrain, Ecotrain: The ecological political economies of High-Speed Rail in Canada.* PhD thesis, Carleton University Ottawa, Ontario.

Kehoe, P. (2017). MIPIM 2017: How HS2 is helping Birmingham Airport expansion. https://www.business-live.co.uk/special-features/mipim-2017-how-hs2-helping-12704046

Kimmerer, R. W. (2015). *Braiding sweetgrass*. Milkweed.

LaDuke, W. & Cowen, D. (2020). Beyond Wiindigo infrastructure. *The South Atlantic Quarterly*, 119(2), 243-268. https://doi.org/10.1215/00382876-8177747

Leamington Observer (2019). Hundreds of saplings meant to offset wildlife destruction caused by HS2 have died. https://leamingtonobserver.co.uk/news/hundreds-of-saplings-meant-to-offset-wildlife-destruction-caused-by-hs2-have-died-13308/

Lee, N. (2017). Powerhouse of cards? Understanding the 'Northern Powerhouse.' *Regional Studies*, 51(3), 478-489. https://doi.org/10.1080/00343404.2016.1196289

Leonardi, E. (2013). Foucault in the Susa Valley: The No TAV Movement and struggles for subjectification, *Capitalism Nature Socialism*, 24(2), 27-40. https://doi.org/10.1080/10455752.2013.789216

Lesutis, G. (2021). Infrastructural territorialisations: Mega-infrastructures and the (re) making of Kenya. *Political Geography* 90, 102459. https://doi.org/10.1016/j.polgeo.2021.102459

Li, Y. & Shapiro, J. (2021). Rethinking Extractivism on China's Belt and Road. In Shapiro, J. & McNeish J. A. (Eds.) *Our Extractive Age: Expressions of violence and resistance.* (pp. 135-154). Routledge.

Locret-Collet, M., Springer, S., Mateer, J. & Acker, M. (Eds.). (2021). *Inhabiting the Earth: Anarchist political ecology for landscapes of emancipation*. Rowman & Littlefield.

Lord Berkeley (2022). Press release: Put HS2 into Administration and set regions to work on their own East West rail schemes! https://www.tonyberkeley.co.uk/#xl_xr_page_hs2

Macpherson, W. J. (1955). Investment in Indian Railways, 1845-1875. *The Economic History Review* 8(2): 177-186. https://doi.org/10.2307/2590986

Mann, J. (2022). How environmentally friendly is the HS2 project? *Railway Technology* https://www.railway-technology.com/analysis/how-environmentally-friendly-is-the-hs2-project/

Martínez Sánchez-Mateos, H. S, & Givoni, M. (2012). The accessibility impact of a new High-Speed Rail line in the UK – a preliminary analysis of winners and losers. *Journal of Transport Geography*, 25, 105-114. https://doi.org/10.1016/j.jtrangeo.2011.09.004

Mateer, J., Springer, S., Locret-Collet, M., Acker, M. (Eds.). (2021). *Energies Beyond the State: Anarchist political ecology and the liberation of nature*. Rowman & Littlefield.

McCarthy, J. (2002). First World political ecology: Lessons from the Wise Use Movement. *Environment and Planning A*, 34(7), 1281-1302. https://doi.org/10.1068/a3526

McKay, B. M. (2017). Agrarian extractivism in Bolivia. *World Development*, 97, 199–211. https://doi.org/10.1016/j.worlddev.2017.04.007

McLoughlin, P. (2015). HS2 and the Northern Powerhouse, Department for Transport https://www.gov.uk/government/speeches/hs2-and-the-northern-powerhouse

Mitchell, T. (2009) Carbon democracy. *Economy and Society*, 38(3), 399-432. https://doi.org/10.1080/03085140903020598

Minn, M. (2013). The political economy of High Speed Rail in the United States. *Mobilities*, 8(2), 185-200. https://doi.org/10.1080/17450101.2012.655973

Mauvaise Troupe Collective (2018). *The Zad and NoTAV: Territorial struggles and the making of a new political intelligence.* Verso.

Miyoshi, C. & Givoni, M. (2013). The environmental case for the High-Speed Train in the UK: Examining the London–Manchester route. *International Journal of Sustainable Transportation*, 8(2), 107-126, https://doi.org/10.1080/15568318.2011.645124

Mongabay (2022). 'What's lacking is respect for Mayan culture': Q&A with Pedro Uc Be on Mexico's Tren Maya. https://news.mongabay.com/2022/05/whats-lacking-is-respect-for-mayan-culture-qa-with-pedro-uc-be-on-mexicos-tren-maya/

Mould, T., QC (2017). Introduction to hybrid bills. https://www.landmarkchambers.co.uk/wp-content/uploads/2018/07/TM-Hybrid-Bills-Introduction.pdf

National Trust (2016). National Trust response to: HS2 Phase Two: West Midlands to Crewe EIA Scope and Methodology Report – Draft for Consultation. https://ntplanning.wordpress.com/2016b/05/13/national-trust-response-to-hs2-phase-2a-consultation-still-more-to-do

NEF (2019a). A rail network for everyone: Probing HS2 and its alternatives. New Economics Foundation. https://neweconomics.org/uploads/files/A_Rail_Network_for_Everyone_WEB.pdf

NEF (2019b). HS2 will serve wealthier passengers and deliver more benefits to London than the North. New Economics Foundation. https://neweconomics.org/2019/03/hs2-will-serve-wealthier-passengers-and-deliver-more-benefits-to-london-than-the-north

Packham, C. (2022). I'm angrier now. *Novara Media*. https://www.youtube.com/watch?v=SHCmTjCsRYw&t=3s

Paterson, M. (2007). *Automobile Politics: Ecology and cultural political economy*. Cambridge University Press.

Patnaik, U. (2017). Revisiting the "drain", or transfer from India to Britain in the context of global diffusion of capitalism. In Chakrabarti, S. & Patnaik, U. (Eds.) *Agrarian and other histories: Essays for Binay Bhushan Chaudhuri*. (pp. 277-317). Tulika Books.

Pépin, J. (2011). *The origins of AIDS*. Cambridge University Press

Pellow, D.N. (2014). *Total Liberation: The power and promise of Animal Rights and the Radical Earth Movement.* University of Minnesota Press.

Preston, J. (2017). Racial extractivism and white settler colonialism: An examination of the Canadian Tar Sands mega-projects. *Cultural Studies*, 31(2-3), 353–375. https://doi.org/10.1080/09502386.2017.1303432

Railway Technology (2020). HS2 costs rise to £106bn: Reaction from the industry https://www.railway-technology.com/analysis/hs2-costs-rise/

Robinson, R.E. (1991). Introduction: railway imperialism. In Davis, C.B. & Wilburn Jr., K.. (Eds.) *Railway Imperialism.* Greenwood Press.

Rodgers, D. & O'Neill, B. (2012). Infrastructural violence: Introduction to the special issue. *Ethnography* 13(4), 401-412. https://doi.org/10.1177/1466138111435738

Ross, C. (2017). *Ecology and power in the age of empire: Europe and the transformation of the tropical world.* Oxford University Press.

Rukin, J. (2019). I have spent a decade fighting HS2. *The Independent*. https://www.independent.co.uk/voices/hs2-rail-trains-new-line-northern-powerhouse-network-a9054456.html

Samiee, M. (2022). Beyond rentier state and climate conflict: Clashing environmental imaginaries and ecological oppression in Iran. In Dunlap, A. & Brock, A. (Eds.) *Enforcing Ecocide: Power, policing & planetary militarization.* (pp. 61-88). Palgrave.

Schröder, R. A., St Martin, K. & Albert, K. E. (2006). Political ecology in North America: Discovering the third world within? *Geoforum*, 37, 163-168. https://doi.org/10.1016/j.geoforum.2005.05.003

Smith, R. (2022). West Midlands HS2 Interchange car park to release land for development. *Rail Advent* https://www.railadvent.co.uk/2022/11/west-midlands-hs2-interchange-car-park-to-release-land-for-development.html#:~:text=Up%20to%2030%20hectares%20of%20land%20will%20be,up%2C%20working%20with%20private%20and%20public%20sector%20bodies.

Soler, G. (2022). Tren Maya, the Mexican megaproject threatening the ecosystems of the Yucatán Peninsula. *Equal Times*. https://www.equaltimes.org/tren-maya-the-mexican-megaproject?lang=en#.Y6WqshXP1hE

Springer, S., Mateer, J., Locret-Collet, M. & Acker, M., (Eds.) (2021). *Undoing human supremacy: Anarchist political ecology in the face of anthroparchy*. Rowman & Littlefield.

Springer, S. (2021) Total liberation ecology: Integral Anarchism, Anthroparchy, and the violence of indifference. In Springer, S. *et al*. (Eds.) *Undoing human supremacy: Anarchist political ecology and the end of anthroparchy*. Rowman & Littlefield.

Stittle, J. (2018). Nationalising Britain's railways is the only way to fix chronic problems – here's why. *The Conversation* https://theconversation.com/nationalising-britains-railways-is-the-only-way-to-fix-chronic-problems-heres-why-88591

Stokes, C. (2023). HS2 fights on despite savage wounds. *Cogitamus.* https://cogitamus.co.uk/chris-stokes/hs2-fights-on-despite-savage-wounds

Stokes. C. at House of Lords (2019). "Zero Chance" of HS2 coming in on budget with "Zero Capacity" released, expert tells Lords. https://www.youtube.com/watch?v=R6isMmoPNkk&t=2s

Stone, J. (2022). High-speed rail must go to Scotland to help reach net zero, report finds. https://www.independent.co.uk/news/uk/politics/hs2-high-speed-rail-scotland-net-zero-b1995662.html

StopHS2. (2015). HS2 Ltd Guilty of Maladministration Says Ombudsman. http://stophs2.org/news/14708-hs2-guilty-maladministration-ombudsman

StopHS2. (2017). Finally – An admission that HS2 means Green Belt development. https://stophs2.org/news/16658-finally-admission-hs2-green-belt-development

StopHS2. (2019). HS2 Ltd officially admit HS2 will increase carbon emissions. https://stophs2.org/news/18111-hs2-officially-admit-hs2-increase-carbon-emissions

StopHS2. (2019b). There's (nearly) no modal shift with HS2. http://stophs2.org/news/18285-nearly-no-modal-shift-hs2

StopHS2 (n.d.). *About us*. https://stophs2.org/about

Tornel, C. (2023). Energy justice in the context of green extractivism: Perpetuating ontological and epistemological violence in the Yucatan Peninsula. *Journal of Political Ecology*, 30(1), https://doi.org/10.2458/jpe.5485

UGC (2021). Future-proofing agreement secured at HS2 growth site. https://www.ugcsolihull.uk/2021/08/02/future-proofing-agreement-secured-at-hs2-growth-site/

UK Parliament (2019). High Speed 2 line. https://questions-statements.parliament.uk/written-questions/detail/2019-03-29/238579

Virilio, P. (2008[1983]). *Pure War*. Semiotext(e).

Woodland Trust (n.d.). *HS2 Rail Link*. https://www.woodlandtrust.org.uk/protecting-trees-and-woods/campaign-with-us/hs2-rail-link/

Walker, J. (2017). High speed rail is happening but will it really benefit the North East? https://www.chroniclelive.co.uk/news/north-east-news/high-speed-rail-happening-really-12518472

Waterstone, M. (2006). Lost geographies of power by John Allen. *Area*, 38(1), 116-117. https://doi.org/10.1111/j.1475-4762.2006.0676c.x

YouGov (2022). Support for High Speed Rail HS2. https://yougov.co.uk/topics/politics/trackers/support-for-high-speed-rail-hs2

Yao, J. (2022). *The ideal river: How control of nature shaped the international order*. Manchester University Press.