

BEYOND THE MASTER NARRATIVE OF 'GREEN' MODERNITY A CRITICAL READING OF THE ENERGY TRANSITION¹

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INTRODUCTION

Climate change is widely regarded by policymakers as the greatest planetary emergency of the contemporary world. In recent years, it has taken a central place in global political, social, and economic discussions. Recognizing that climate change is caused by greenhouse gas emissions – a consequence of an energy system based on the extraction and burning of fossil fuels – states have developed ‘energy transition’ programs and policies. The energy transition refers to the shift in the global energy industry to move away from fossil-based energy production and consumption, such as oil, natural gas, and coal, towards renewable energy sources, such as wind, solar or hydropower, and energy storage systems. This process, which involves the adoption of new low-carbon technologies, infrastructures, and innovations across all productive sectors, is also known as ‘decarbonization’ or ‘carbon neutrality’.²

Aligned with the goals of the Paris Agreement (2015), the European Union (EU) has embraced the energy transition as an urgent, necessary, and top-priority commitment for the coming decades. In December 2019, the European Commission announced the European Green Deal, a set of legislative proposals aimed at achieving carbon neutrality by 2050.³ At the national level, in 2019, the Roadmap for Carbon Neutrality 2050 was published, which, in alignment with the Paris Agreement, sets out the vision and pathways for Portugal to achieve carbon neutrality by mid-century.⁴

ABSTRACT

This article critically reflects on the dominant narrative on the climate crisis and its energy transition programs. The energy transition has been reproducing the structures of the contemporary capitalist system, namely its extractivist, technological and financial apparatuses. Inspired by critical perspectives that challenge the dichotomous divisions perpetuated by the hegemonic ontological framework, I argue that in order to face the ecological crisis, we must adopt practices based on non-dualistic ontologies that recognize the deep and close relationships of (inter)dependence that sustain life on Earth.

Keywords: energy transition, carbon neutrality, ontology, carbon reductionism.

RESUMO

**PARA ALÉM DA NARRATIVA-
-MESTRA DA MODERNIDADE
«VERDE»: UMA LEITURA
CRÍTICA DA TRANSIÇÃO
ENERGÉTICA**

Este artigo, de carácter reflexivo, procura tecer uma leitura crítica à narrativa dominante sobre a crise climática e os seus programas de transição energética. A transição energética



em curso, ao concentrar-se exclusivamente na redução das emissões de dióxido de carbono, negligência a complexidade das interdependências ecológicas, reproduzindo, assim, as políticas ontológicas hegemônicas, baseadas numa ideia de separação entre os humanos e os não humanos. Esta perspectiva redutora legítima, por sua vez, novas formas de destruição socioecológica e padroniza as respostas à crise climática, disciplinando comportamentos sociais, standardizando políticas públicas à escala mundial e eliminando possibilidades de diálogo sobre outras soluções. Nesse sentido, a transição energética tem vindo a reproduzir e a expandir as estruturas do sistema capitalista contemporâneo, nomeadamente os seus aparatos extrativos, tecnológicos e financeiros. Inspirando-me em perspectivas críticas, que desafiam as divisões dicotômicas perpetuadas pelo quadro ontológico hegemónico, argumento que, para fazer face à crise ecológica, devemos adotar práticas que repousem em ontologias não dualistas, e que reconheçam, por isso, as profundas e íntimas relações de (inter) dependência que sustentam a vida na Terra.

Palavras-chave: transição energética, neutralidade carbónica, ontologia, reducionismo carbónico.

This transition is unleashing a global growth in demand for raw materials known as ‘transition minerals’, namely lithium, cobalt, graphite, copper and nickel, required to manufacture green technologies. Lithium – which is used in the rechargeable batteries of electric vehicles and energy storage systems – has been leading this race for ‘transition materials’. The Portuguese government views the energy transition as an opportunity to place the country in a position of leadership within the European continent⁵ and has been actively granting prospection and exploitation contracts for lithium since 2016.⁶

In this race for the new ‘white gold’, the mountains of Barroso, in the district of Vila Real, and many other territories, were transformed into a commodifiable resource to be exploited. In the villages of Covas do Barroso, Romainho, and Muro – classified by the United Nations Food and Agriculture Organization as World Agricultural Heritage –, there are plans to open what would potentially be the largest open-pit lithium mining exploitation in Western Europe. This mining project has faced strong opposition from local communities. In response to the green rhetoric of the energy transition, they assert that ‘Green is Barroso!’ The voices opposing these projects suggest that decarbonization strategies are a contested realm, politically, socially, and ontologically.

While the prevalent narrative of fighting climate change points to decarbonization as a univocal solution to combat climate change, this narrative has been gradually deconstructed by some social movements and academic research. The energy transition, by focusing almost exclusively on carbon emissions, reduces the ecological crisis to a climate crisis, and the climate to a matter of atmospheric carbon. Considering that these challenges are ‘addressed’ by attacking only one part of the problem, the energy transition reproduces the dominant ontology, ignoring the intricate network of deep interdependencies that sustain life on the planet. In doing so, it is justifying new forms of ‘green’ extractivism, perpetuating the dominant extractivist-capitalist paradigm that reduces nature to a mere resource to be exploited for the accumulation of capital through technological solutions.⁷

In this article, I attempt to offer a critique of the dominant narrative on climate change, arguing that it rests on a reductionist perspective which, in turn, legitimizes new forms of socioecological destruction and standardizes the responses to the climate crisis, disciplining social behaviors and homogenizing public policies on a global scale.

Drawing inspiration from critical perspectives that challenge the dichotomies perpetuated by the hegemonic ontological framework, I argue that, to address the ecological crisis, we must adopt non-dualistic ontologies that recognize the deep and intimate relationships of (inter)dependence that sustain life on Earth. In this sense, the ‘transition’ that is urgently needed is much more radical than a simple shift in the origin of our energy sources: it requires a transformation in how we relate to the world, interact amongst humans, and engage with non-human beings. In other words, an ontological transformation is required. From this ‘ontological turn’, it will be possible to construct and reclaim narratives that encompass many worlds, and not just the world of Western modernity, now painted ‘green’.

THE MODERN ONTOLOGICAL ARCHITECTURE AND THE ECOLOGICAL CRISIS

This article departs from the theoretical-philosophical premise that the levels of social, climate, environmental, and ecological degradation we experience are the result of a

severe separation between humans and non-human nature. This separation, accentuated, reinforced, and accelerated by the structures of the contemporary capitalist system, finds its ideological substrate in the modern ontological model. By ‘ontological model’, we mean the fundamental assumptions that inform our conceptualization, understanding, and structuring of reality and the world around us. ‘Ontology’, as a branch of philosophy, refers to the

THE LEVELS OF SOCIAL, CLIMATE, ENVIRONMENTAL, AND ECOLOGICAL DEGRADATION WE EXPERIENCE ARE THE RESULT OF A SEVERE SEPARATION BETWEEN HUMANS AND NON-HUMAN NATURE. THIS SEPARATION, ACCENTUATED, REINFORCED, AND ACCELERATED BY THE STRUCTURES OF THE CONTEMPORARY CAPITALIST SYSTEM, FINDS ITS IDEOLOGICAL SUBSTRATE IN THE MODERN ONTOLOGICAL MODEL.

study of being, of the real, and of reality. In the field of social and human sciences, over the last decade, an ‘ontological turn’ was inaugurated which has led to reflections on how ontological questions intersect with political, social, and economic issues.⁸ By ‘ontological politics’, we refer to how the assumptions we hold about the nature of the world (about reality) shape human action within it, and, consequently, generate political, social, and economic effects, including eco-ethical effects.⁹

Currently dominant, the modern ontological architecture structures the world – and our understanding of it – in a dualistic and hierarchical manner. According to Latour,¹⁰ the ontological model of modernity is based on a ‘Great Divide’ between nature and culture/society – and ‘this Great Divide serves as the ontological substrate for a system of hierarchies that dualistically structure social reality’:¹¹ man/woman; reason/emotion; mind/body; subject/object; civilized/savage. These binaries are, in turn, understood as ‘pairs of opposites with unequal value’,¹² that is, the domain of ‘culture’ is seen as ‘superior’ to that of ‘nature’, ‘reason’ is deemed ‘superior’ to ‘emotion’, and so forth. From an ecofeminist perspective, these dualisms are deeply gendered: they are associ-

ated with and attributed to one of the two genders, conceived binarily. ‘Masculine’ is associated with the categories of ‘reason’ and ‘culture’, and ‘feminine’ with the categories of ‘emotion’ and ‘nature’.¹³

The modern way of thinking and acting on the world, by structuring reality dualistically, legitimizes the control of one domain over the other.¹⁴ Only by understanding ‘culture/society’ as ‘superior’ to ‘nature’ can we justify its control, colonization, and extraction. Modern scientific rationality has reduced the complexity of the networks that make up life to a mechanical and mechanistic logic: instead of understanding nature as a living organism, it perceives it as a machine, capable of being dominated by human wisdom.¹⁵ This ‘march of reason over Nature’ has been legitimizing the manipulation of the latter for human benefit.¹⁶ The hegemonic ontological model suggests that we are the ‘owners and masters’ of nature and that we can exceed its limits without suffering the effects of this depletion¹⁷.

We understand, then, how this ‘Great Divide’ – this disconnectedness between us, human beings, and nature – served as an ontological substrate for the practices that caused the levels of socioecological destruction we witness today, and are continuously accelerated and expanded by the structures of the contemporary capitalist system. In fact, by turning nature into a resource to be controlled, the modern ontological model has provided ideological support for the two foundational pillars of contemporary capitalism: infinite growth and continuous development. Similarly, this ontological dualism has historically justified relations of oppression, domination, and exploitation towards those beings ontologically constructed as ‘inferior’ – perceived as ‘close(r) to nature’, ‘feminine’, ‘savage’, and/or ‘emotional/irrational’.¹⁸ If, on the contrary, we understood ourselves as an intrinsic part of nature, we would not have decimated, exploited, or corrupted it. If we understood ourselves as an intrinsic part of an intricately interconnected whole, from which we depend on, we would not have perpetuated relations of oppression nor destroyed so many of the webs that sustain the possibilities of life.

THE ONTOLOGICAL POLITICS OF THE ENERGY TRANSITION

The ongoing energy transition reflects the modern worldview and its ontological architecture of separation. The first reason why the energy transition reproduces the ontology of separation is that it focuses solely on the climate – what Charles Eisenstein¹⁹ has termed ‘climate fundamentalism’. The second reason is that, within climate issues, it almost exclusively focuses on greenhouse gas emissions, particularly on carbon dioxide – a phenomenon known in the literature as ‘carbon reductionism’.²⁰ In doing so, the energy transition does not question the ontological model that underlies socioecological destruction and, instead of combating the latter, ends up creating new forms of ecological violence and ontological standardization, as we will see.

By focusing almost solely on the issue of climate change, the hegemonic narrative perpetuates the idea that to achieve a ‘sustainable’ future, it is sufficient to ‘solve’ the challenge of climate change. In the terms of Charles Eisenstein,²¹ this ‘climate funda-

mentalism' is based on an ontology that conceives the climate as a sphere distinct and separate from ecology, which is, in turn, decoupled from socio-political and economic issues.²² In this sense, this narrative reproduces the modern ontology that views the natural world as mechanical, thereby ignoring the complexity of the biosphere, 'in which everything is interconnected',²³ and reducing it to mathematical calculations. The networks that sustain life cannot be reduced – or flattened – solely to climate issues: climate change itself is affected (and impacted) by numerous other ecological processes, from soil erosion to rising sea levels, to the extinction of various non-human species, desertification, and deforestation, as well as numerous other socio-economic processes, such as mass consumption or intensive farming. From an ecological perspective, reality is not a 'collection of separate and causally dissociated phenomena',²⁴ but rather the result of a complex matrix of interdependencies that extend beyond climate alone. The dominant narrative on environmental issues, by giving almost exclusive priority to climate concerns, also falls into what Eisenstein²⁵ coined as 'carbon reductionism'. According to Gelderloos, 'carbon reductionism' refers to the process through which 'the ecological crisis is reduced to and compartmentalized into a simple (and technocratic) issue of atmospheric carbon'.²⁶ Once again, carbon reductionism reproduces the dominant ontology that ignores broader ecological contexts and the more-than-human webs that sustain the possibility of life on Earth. By pinpointing a single and identifiable cause – the reduction of carbon emissions – the dominant narrative on the energy transition facilitates the conversion of nature into quantifiable and commodifiable units. Indeed, climate policies conceptualize environmental parameters into technical aggregates and mathematical schemes (such as biodiversity or carbon offset schemes; carbon credits) that 'decouple socio-economic activity from environmental materiality' and 'rely on a disembodied ontology' that creates a 'distancing' between human activities and the intertwined and 'embodied natures' on which they depend.²⁷ This worldview is heavily grounded in modern scientific rationality, which perceives nature as a machine, capable of being calculated, quantified, and manipulated. Currently, this ontology serves the purposes of the financialized capitalist system: for instance, carbon emissions can be bought and sold in the global carbon market. Similarly, by treating 'climate' as something we can 'solve' or 'fix' by reducing – or stopping – carbon emissions, this perspective favors what is referred to in the literature as a 'techno-fix'. A techno-fix involves using technology to solve a problem created by previous technological interventions. According to Evgeny Morozov, who coined the term 'technosolutionism',²⁸ this practice is, in fact, 'an ideology that recasts complex social phenomena to neatly defined problems with definite, computable solutions'.²⁹ The ideology according to which it is possible to find a solution to all problems by relying on new and better technologies favors the structures of the capitalist system, as these technological solutions are mediated by the market. In the case of addressing climate change, we can argue that we are witnessing the emergence of a 'techno-sci-

entific dogmatism’,³⁰ because, to a large extent, the ‘solutions’ presented for this challenge are based on the development of new technological infrastructures. The case of geoengineering is emblematic: geoengineering refers to a set of technologies aimed at intentionally modifying the Earth’s system on a large scale to fight climate change.³¹ Geoengineering is widely considered in the literature as a form of ‘technosolutionism’ because it is a solution strictly based on technological responses that do not address the root of the problem.³² Although still controversial, these technologies have been gaining prominence in political and academic discussions on climate mitigation³³ and operate under the same ontological perspective that reduces the challenges we face to a carbon emission problem.

In this sense, we can argue that the ‘climate crisis’ and, in particular, ‘carbon’, have become a metanarrative legitimizing a series of policies and mechanisms with serious

■ IN THE NAME OF THE GREEN ENERGY TRANSITION, GOVERNMENTS AND COMPANIES HAVE JUSTIFIED THE EXPANSION OF NEW EXTRACTIVE FRONTIERS, SUCH AS THE PLANNED LITHIUM MINES IN THE BARROSO MOUNTAINS.

environmental, ecological, social, and economic consequences. In the name of the green energy transition, governments and companies have justified the expansion of new extractive frontiers, such as the planned lithium mines in the Barroso mountains. The commodification and subsequent

extraction of nature are justified as a means to achieve carbon neutrality, regardless of their social, human, or ecological impacts. The synonymy created between ‘green’ or ‘sustainable’ and ‘carbon-neutral’ is problematic because it equates mining extraction with sustainability.

Moreover, even in the case of so-called ‘renewable’ energy technologies and infrastructures – such as solar panels, wind turbines, or high-voltage power lines –, several authors have pointed out how the so-called ‘renewable’ infrastructures and technologies require continued reliance on both extractivism and fossil fuels.³⁴ The works of Alexander Dunlap,³⁵ in particular, have extensively documented the continuum connecting green industries to fossil industries. Highlighting both the similarities and continuities between green industries and extractive industries, and between renewable energies and fossil fuels,³⁶ Dunlap³⁷ suggests the term ‘fossil fuel+’ or ‘fossil fuel 2.0’ as more appropriate to designate renewable energies since these do not imply a veritable abandonment of fossil fuels. In the words of York and Bell,³⁸ considering that ‘there has been no real shift from one [energy] source to another’, as so-called ‘renewable’ energies also depend on fossil fuels, the current paradigm more closely resembles an ‘energy addition’ rather than an energy transition.

In addition to justifying environmentally destructive practices, the hegemonic narrative of the energy transition by establishing a universal definition of what ‘saving the planet’ entails – closes off the possibilities for dialogue about other potential solutions. The urgency to reduce carbon emissions is shared among actors from various spheres

– governments, companies, and social movements – forming an unequivocal global consensus. In this sense, we can consider that a ‘regime of truth’ has been created, in Foucault’s terms, based on a technoscientific rationality that, under the guise of scientific neutrality, hinders the possibility of questioning it. The rhetoric of inevitability – the need to undertake an energy transition dependent on critical raw materials – coupled with the global consensus, prevents any questioning of this narrative.³⁹

This dominant metanarrative on the climate crisis favors, on the one hand, the standardization of public policies, and on the other hand, processes of political governmentality and of social disciplining. On the one hand, it promotes the homogenization of public policies, as they now have to follow master guidelines from authorities, such as the United Nations or the EU. The standardization of the responses to the problem (carbon reductionism) and the framing of the problem (climate fundamentalism) only serve to favor hegemonic power structures, which, in the name of saving the planet, create new markets, new profit opportunities, and expand their technological apparatus. On the other hand, the standardization and homogenization of public policies worldwide are creating a new form of governance, by which the political decisions are now dictated by technoscientific rationality. This new governmentality is also disciplining the ‘behaviors’ of consumers: the ‘good’ consumer is the one who complies with decarbonization directives and, therefore, buys an electric car, for example.

In this section, I sought to demonstrate how modern ontological assumptions are currently reproduced in the energy transition. This narrative reaffirms the ontology that views humans as ‘owners and masters’ of nature, understood, in its turn, as ‘fixable’, ‘measurable’, and ‘commodifiable’. In doing so, it is creating new forms of ecological violence, such as lithium mines, and accentuating the ontological standardization of climate discourses, normalizing the desire to aspire to a ‘green’ future facilitated by ‘technosolutions’. With these reflections, my intention has not been to undermine the seriousness of the threat posed by the climate crisis or the need to adopt policies to reduce carbon emissions. Climate change is undoubtedly a serious global problem, with highly detrimental social, political, economic, and ecological consequences – which can be felt already, especially among the world’s most vulnerable populations and regions. It is foreseeable that these consequences will continue to spread in an increasingly intense and frequent manner. With this article, I aimed to frame the challenge of climate change within the vast – and complex – networks of socioecological (inter)dependencies, emphasizing that it constitutes nothing but a symptom of the disruption of the networks that sustain life. Furthermore, the purpose of these reflections was to demonstrate how the hegemonic narrative, by framing decarbonization as inevitable, constrains sociological and anthropological imagination about alternative futures and perpetuates the dominant understanding of the world that triggered the crisis we seek to address. This onto-logics – which claims for itself the right to be the only one – dismisses other ‘onto-epistemological possibilities for “knowing nature” and conceptualizing socioenvironmental

issues’⁴⁰ outside the ontology of separation and the logics mediated by the market and technology. Taking this perspective seriously, several authors have suggested that it is necessary to go *beyond* the dominant energy transition, thus dreaming of other futures.

UNDOING THE ENERGY TRANSITION: SACRED MOUNTAINS, BODY-TERRITORIES, AND MORE-THAN-HUMAN NETWORKS

Recognizing that the ontological dualism of modern ontopolitical architecture has created a profound disconnection between humans and the non-human world, it is urgent to adopt ontologies that undo these dualisms. In the words of ecofeminists Maria Mies and Vandana Shiva, the dimension of the crises we face invites us to ‘think differently’, to adopt ‘cosmologies’ that recognize that ‘life in Nature is sustained by the bias of cooperation, mutual care, and love’.⁴¹

In the specific case of the energy transition and the climate crisis, we might say that the problem does not limit itself to carbon emissions – it is about caring for a living

IN THE SPECIFIC CASE OF THE ENERGY TRANSITION AND THE CLIMATE CRISIS, WE MIGHT SAY THAT THE PROBLEM DOES NOT LIMIT ITSELF TO CARBON EMISSIONS – IT IS ABOUT CARING FOR A LIVING PLANET, NURTURING THE MORE-THAN-HUMAN NETWORKS THAT ALLOW THE FLOURISHING OF THE MULTIPLE EARTHLY BEINGS THAT COEXIST ON THIS PLANET.

planet, nurturing the more-than-human networks that allow the flourishing of the multiple earthly beings that coexist on this planet. In his latest book, biologist and mycologist Merlin Sheldrake⁴² brilliantly shows how life is a network of interwoven and entangled webs. In it, Sheldrake takes us on a journey into the mycelial networks, which correspond to the tangled mass of fungal hyphae that can extend for endless


kilometers, sustaining life in this living organism called Earth. Sheldrake explains how all life on Earth is the result of symbiotic relationships, i.e., relationships of deep and close intimacy formed between unrelated organisms. The human body, for example,

‘consists of more microbes than human cells; there are more bacteria in our intestines than stars in the galaxy; it’s the approximately 40 trillion microbes living inside and outside our bodies that nourish us, producing the minerals we depend on and enabling us to digest the food we consume’.⁴³

Our ‘self’ is, after all, more bacterial and microbial than human. *Being* human involves *being* non-human. We are composed – and decomposed – by other beings. In the words of the anthropologist Donna Haraway, ‘all earthlings are kin in the deepest sense’, they are ‘linked in complex, intertwined, and “tentacular” ways’.⁴⁴ In other words, we are alive because we are profoundly and intimately interconnected. Nurturing these intimate relationships among all terrestrial beings and adopting ethics and practices of care that go beyond the human is how we can sustain life on Earth.

The concept of ‘body-territories’ (*cuerpos-territorios*) – developed by decolonial community feminists from indigenous Americas – illustrates the ontological unity between our bodies and the territories we inhabit. We cannot think of ourselves without considering how we relate to the space we inhabit, and which we build, and shape. Going further, and adopting an ecological perspective, we can say that our bodies are themselves territories – hosting thousands of beings –, which, in turn, inhabit a larger territory, itself composed (and decomposed) by many other bodies and beings. In contrast to green energy transition projects for whom mountains are perceived as empty spaces awaiting to be occupied (a highly patriarchal view), a more-than-human ethics of care recognizes mountains as living entities. Mountains are an ecology of existences: they are bodies-territories hosting hundreds of beings, giving life to more-than-human networks, and organizing social and economic practices around them. Mountains, in Barroso and elsewhere, are guardians of life. To ravage them in the name of a ‘green’ transition would entail destroying the life they nurture, consequently affecting all life on Earth.

CONCLUSION

As ecofeminist researcher Stefania Barca⁴⁵ argues, Western modernity has created a ‘master narrative’ about the world that needs to be ‘rejected: this is because by accepting it, we subscribe to the idea that history has come to an end and that no more resistance can be expected. That the world is what the master made of it’.⁴⁶ This master narrative, now painted green in the form of the energy transition, urgently needs to be deconstructed. According to Barca, undoing the master model involves telling stories that escape its ontological colonization – the ‘other-than-master stories’⁴⁷). In Barroso, with all its contradictions, we find some of these stories: here, every day, people care for their lands and animals; they communally share and manage the water and help each other in everyday practices; they harvest the plants they have sown and drink those that they have fermented. Through slow rhythms, more-than-human networks are sustained, fostering harmony between social and economic practices and their environmental and ecological realities. It was partly because of these reasons that this region was the first in Portugal to be classified as World Agricultural Heritage by the Food and Agriculture Organization of the United Nations (FAO) in 2018. This organization also recognizes the significant number of ‘very significant and relatively intact environmental areas found in this region’, hosting ‘numerous plant and animal species that are extremely important for nature conservation’.⁴⁸ The ‘green’ energy transition projected for these mountains – in the form of various open-pit mines – is the opposite of what they represent and safeguard. In times when nurturing life is more urgent than ever, it seems counterproductive to invest in ‘solutions’ that are, in fact, part of the problem. 

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ENDNOTES

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- 31 Geoengineering technologies can be either solar radiation management technologies or carbon dioxide removal technologies.
- 32 CARVALHO, António; RIQUITO, Mariana – "'It's just a band-aid!': public engagement with geoengineering and the politics of the climate crisis". In *Public Understanding of Science*. Vol. 31, No. 7, 2022.
- 33 *Ibidem*.
- 34 MARTÍNEZ, Viviana; CASTILLO, Olga L. – 'The political ecology of hydropower: social justice and conflict in Colombian hydroelectricity development'. In *Energy Research & Social Science*. No. 22, 2016, pp. 69–78; AVILA-

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35 DUNLAP, Alexander – 'Does renewable energy exist? Fossil fuel+ technologies and the search for renewable energy'. In BATEL, Susana; RUDOLPH, David, eds. – *A Critical Approach to the Social Acceptance of Renewable Energy Infrastructures: Going beyond Green Growth and Sustainability*. Palgrave Macmillan, 2021; DUNLAP, Alexander; MARIN, Diego – 'Comparing coal and "transition materials"? Overlooking complexity, flattening reality and ignoring capitalism'. In *Energy Research and Social Science*. No. 89, 2022; DUNLAP, Alexander; LARATTE, Louis – 'European green deal necropolitics...'

36 We can, by way of example, consider the life cycle of a wind turbine, often regarded as the most 'renewable' energy technology. The construction and assembly of wind turbines require the extraction of hundreds of tons of materials – from steel to concrete, fiberglass, copper, and rare materials such

as neodymium and dysprosium – which has a significant ecological, climatic, and energy impact. To install a turbine, it is necessary to transport these raw materials in large trucks or ships, flatten hectares to make way on elevated terrain, and erect the structures with large cranes – all of which require the use of fossil fuels, notably diesel. Additionally, a key ingredient for the operation of wind turbines is oil, which ensures lubrication, hydraulic systems, and turbine gears. During their operation, wind turbines often end up affecting part of the populations of surrounding birds and bats, as well as the life of the soils where they are located. Finally, at the end of their life cycle, wind turbines – as well as solar panels or lithium batteries – leave behind tons of non-recyclable waste.

37 DUNLAP, Alexander – 'Does renewable energy exist?...'

38 YORK, Richard; BELL, Shannon Elizabeth – 'Energy transitions or additions? Why a transition from fossil fuels requires more than the growth of renewable energy'. In *Energy Research and Social Science*. No. 51, 2018, pp. 40-43.

39 RIQUITO, Mariana – 'Futuro minado? Não, obrigado!'

40 SULLIVAN, Sian – 'What's ontology got to do with it?...', p. 232.

41 MIES, Maria; SHIVA, Vandana – *Ecofeminism*, p. 6.

42 SHELDRAKE, Merlin – *Entangled Life. How Fungi Make Our Worlds, Change our Minds, and Shape our Futures*. Penguin Random House, 2020.

43 *Ibidem*, p. 18.

44 HARAWAY, Donna – 'Anthropocene, capitalocene, plantationocene, chthulucene: making Kin'. In *Environmental Humanities*. No. 6, 2015, p. 162.

45 BARCA, Stefania – *Forces of Reproduction...*

46 *Ibidem*, p. 5.

47 *Ibidem*.

48 FAO – *GIAHS, Globally Important Agricultural Heritage Systems – Barroso Agro-Silvo-Pastoral System*. Food and Agricultural Organization of the United Nations, 2018. Accessed: 16 July 2023. Available at: <https://www.fao.org/giahs/giahsa-roundtheworld/designated-sites/europe-and-central-asia/barroso-agro-silvo-pastoral-system/detailed-information/en/>.

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