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“Just” energy? An ecofeminist analysis and critique of a predominant conception of energy

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Abstract

Background This theoretical paper offers an ecofeminist analysis and critique of a specific conception of energy. The hypothesis is that, at least in the Western context, there is a characteristic socio-economic understanding of energy as a resource and commodity for human needs and the development of human societies. This conception corresponds to a cultural understanding that is both different from and broader than the scientific notion of energy. Such a conception has become part of several narratives, including energy policy. Our research question is: *does this conception of energy as a commodity and resource affect the relation between humans and nature? And if so, how?*

Results Drawing on the work of Val Plumwood, and Greta Gaard, we argue that conceiving of energy as a resource and commodity for human needs and the socio-economic development of human societies reinforces and mediates the hierarchical and oppressive dualism “human-nature”, thus contributing to backgrounding, excluding, incorporating, and instrumentalizing some parts of nonhuman nature as well as some human groups.

Conclusions The idea of energy as a commodity shapes public debates and policies, worsening existing environmental issues. This dominant perspective affects how people respond to environmental challenges and crises, both individually and collectively. This article aims to encourage more critical and open discussions about energy. It suggests that researchers and policymakers adopt more radical and less oppressive approaches in their academic work, benefiting both the human and non-human world.

Keywords Energy, Conception of energy, Ecofeminism, Energy justice, Environmental ethics, Energy ethics

Background

Many countries are today transitioning their energy systems from fossil-based sources to more sustainable and less resource-intensive alternatives. Energy transitions constitute massive and complex transformations of socio-technical systems. Energy social sciences, energy humanities, and energy ethics have developed as the main fields that address the societal, cultural, economic, and political

dimensions of energy transitions. A few approaches that have emerged within energy justice literature have become the primary means of tackling these dimensions, especially regarding issues of injustice, poverty, and related policies and governance. In an attempt to better connect those fields with that of environmental ethics, this article offers an ecofeminist analysis and critique of a specific conception of energy. The term “energy” is central in many current research areas and debates, ranging from physics to socio-political issues such as energy justice [1–3], energy ethics [4–7], and energy democracy [8–12]. From a scientific standpoint, textbooks typically define energy as “[t]he potential or capacity of a body or system to do work [...] by virtue of its motion, position,

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chemical structure, etc., frequently regarded as a quantifiable attribute or property which can be acquired, transferred, and expended”.¹ This scientific conception of energy has long been studied by historians of science and technology [e.g., 13], feminist political ecology scholars [e.g., 14], physicists [e.g., 15], and cultural critics [16]. However, as scholars have pointed out, besides this understanding of energy, the conception encompasses “multiple meanings in both its every day and more technical uses” [17, p. 28]. In this article we maintain that this way of conceiving of energy is “just” one among others, although it is predominant for (good) techno-scientific and engineering reasons.² In other words, beyond the scientific understanding of energy, there are also additional “meanings of energy”, and different usages of the term are currently at play in various domains and discourses (i.e., economics, sociology, anthropology, environmental and climate ethics). These “multiple meanings” are often only indirectly connected to the scientific conception of energy and do not coincide with it [16, 18].³ In these other cases, we are dealing with conceptions or understandings that are value-laden according to the specific socio-economic context in which they occur, and sometimes contain normative elements. For example, in discourses as diverse as poverty studies [21, 22], economics [23, 24], or public policy [25, 26], the term energy seems to signify different things, such as a means to alleviate suffering and improve well-being (i.e., energy services), a commodity, or the processes of conversion, distribution, and use of resources for human benefit, respectively. In principle, these alternative “meanings of energy” can be discovered and studied within specific debates (e.g., just energy transition, energy poverty, energy justice energy policy, energy geopolitics). So far, however, these multifaceted meanings have rarely been addressed as a specific object of research. Even scholarship in energy social sciences tends to tacitly assume some of these understandings when energy-related expressions are used without questioning or problematizing them. For example, in EU energy policy documents (for more info see Appendix 1), the term energy is used in various ways and in association with many other terms as part of specific linguistic

expressions (e.g., “energy transitions”, “energy poverty”, “energy systems”, “energy justice”, “energy technologies”, “renewable energy”, “energy sources” and so forth). In these policy documents, energy is primarily viewed as a *resource and commodity for human use and benefit*.⁴ Some expressions stress an economic orientation and refer to energy as something that humans require, pay for, produce, generate, convert, obtain from natural resources, use and consume, manage, and save, and eventually dispose of. Simultaneously, policy documents usually assume that the environment primarily matters insofar as it supports fundamental human needs and interests, thus reinforcing instrumental attitudes and visions towards nature as it relates to energy provision. This is well summarized in sentences such as: “what is good for the planet is good for people and the economy” [27], or “If we help delicate land and ocean ecosystems recover, they can provide for life on the planet and fulfill their role in the fight against climate change” [28].

Our hypothesis is that there exists, at least in the Western context, a characteristic socio-economic understanding of energy as a resource and commodity for meeting human needs and the socio-economic development of human societies. This conception of energy as a commodity and resource for human beings has recently begun to be addressed by scholars. For instance, moving from political ecology, Tornel [28] explores the capitalistic and fetishized conception of energy implied in energy justice studies, defining energy as “a tool for subjugation and domination” [28, p. 15]. Cederlöf [29] acknowledges that even in political ecology, energy is considered “an object for human appropriation” (p. 70) and as a “resource” (ivi, p. 71) and from his perspective this conception leads “to contentious extractive geographies and unequal distributive outcomes” (ivi, 81). From a Marxist and historical standpoint, Pirani [30] analyzes the commodification process which has brought “many people—including, but not only, politicians and economists—[to] refer to ‘energy’ as something that is being, or even must be, bought and sold” (p. 1). Moreover, he illustrates the categorization of energy carriers and resources (e.g., wood, coal, and other fuels) as commodities. In this regard, as Urry proposes, energy could be considered the “precondition of all commodities” [31, quoting Schumacher]. Finally, the conception of energy as a commodity for humans has been questioned also from marginalized worldviews, thus contributing to a sharper decolonial awareness in energy social studies [28, 32, 33]. For example, the members of the social movement Luz

¹ https://www.oed.com/dictionary/energy_n?tab=meaning_and_use#5622769.

² The term “just” in the title is purposefully ambivalent as it can mean “only” but also “right”. In general, however, we mostly intend the former, while the latter is intended to be provocative.

³ Whilst a concept refers to a general idea or understanding of something, a conception indicates the way in which something is perceived or the ability to form or understand mental concepts and abstractions. Here, we avoid using the term (energy) “concept” but use (energy) “conception”, or “understanding” essentially as synonyms in the sense of conceptions of energy that are, for the most part, unconscious and tacit. For a more analytic discussion of the concept-conception distinction, see, e.g., [19] or [20].

⁴ Conceptualizing energy as a (re)source represents a precondition for conceptualizing it as a commodity. In other terms, while most, if not all, human groups conceptualize energy as the former, only some human groups understand energy also as the latter.

y Fuerza del Pueblo working in Chiapas, Mexico, reject “any conception of electricity as a ‘commodity,’ ‘good’ or ‘service’ that is subject to market laws” [34] and support a conception of energy as a right connected to Madre Tierra. Remarkably, in all these and other studies concerning the conception of energy as a commodity, there is always a reference to the corresponding understanding of nature. This may depend on the fact that—in the words of human geographer Calvert—energy is “the primary mediator in the human–environment relationship” [35 p. 106]. Bearing this in mind, in this article we focus on the “energy–nature relation” to signify the relation between energy and nature as they are primarily conceptualized by humans, at least in the Western context.⁵

This relationship between energy and nature is particularly relevant today, as the effects of the energy sector on the environment become increasingly apparent.⁶ The energy sector is a major contributor to environmental degradation, including air pollution, greenhouse gas emissions, and habitat destruction. To create more sustainable societies, reforming the energy system is essential. However, this reform must go beyond mere technological advancements. We believe that true reform starts with a deeper engagement in understanding terms such as “sustainability” and “energy”. This understanding can illuminate the shortcomings of current strategies and help set and achieve ambitious ecological goals. For example, fossil fuels, which still dominate the global energy mix, are a leading source of carbon emissions, contributing significantly to climate change and health issues. Transitioning to renewable energy sources like wind, solar, and hydroelectric power is crucial, but also requires a cultural and systemic shift in how we perceive and use energy.

We offer a partial and theoretical answer to the following broad question: *Does the conception of energy as a commodity and resource affect the relation between humans and nature? And if so, how?* People “learn” to conceptualize energy as a resource and commodity for humans through education and socialization. For instance, nature figures necessarily as an energy (re) source when it provides fuels or nutrients. Of course, we do not deny that humans rely on nature and the energy sources that come from it, or that humans need to use these resources in order to survive and thrive. Rather,

a prevalent understanding of energy as a resource and commodity for humans contributes also to worsening socio-ecological problems.

We suggest that the way policy makers and practitioners conceptualize and talk about energy reinforces dualisms which are taken up as theoretical assumptions within policy documents. To understand if and in which terms the conception of energy outlined above affects the relation between humans and nature, we rely on the specific ecofeminist contributions of Greta Gaard and Val Plumwood.

Since the 1970s, environmental ethicists have considered the topic of energy [38] by addressing issues such as pollution derived from energy conversion, distribution, and waste, moral obligations and responsibilities towards future generations, non-human beings, and ecosystems. However, *explicit* engagements with the *conception* of energy have not been very common (i.e., it seems that only a few titles contain the term “energy”, e.g., [39]). We suggest that a philosophical analysis of conceptions of energy could be useful to unveil additional theoretical assumptions connected to, for example, Western, patriarchal, and gendered dimensions that have been underexplored in energy social science research [32]. Ecofeminists have long integrated gendered perspectives with environmental issues, advocating for ecological sustainability beyond economic globalization. As far as the energy sector is concerned, Brownhill and Turner, for instance, use an ecofeminist lens to examine the role of women in community resistance against oil companies in Nigeria, responsible for the exploitation of indigenous people, including women, and the environmental degradation of the country [40]. While various perspectives could be used to reflect on these issues, we intentionally focus on ecofeminism to hypothesize that by conceptualizing energy as a commodity, some parts of nature (humans and nonhumans, living and nonliving beings and entities) become commodified for human aims and benefits. Recent research has highlighted the benefits of ecofeminist analysis in energy social studies, particularly regarding the intersectional dimensions of many energy-related issues [32, 40]. For example, Sovacool et al. [32] suggest incorporating ecofeminist perspectives into energy social science scholarship. However, there is a risk that incorporating critical voices such as ecofeminism into the mainstream discourse of a particular domain may perpetuate a colonizing logic of oppression in which the oppressed subjects, their voices and claims, are swallowed up in the discourse they aim to criticize [41].⁷

⁵ In energy studies, some authors have already investigated the “energy–society relation” [36, 37]. When referring to the Western world, it is important to note that terms such as “Western,” “non-Western,” “Global South,” “Global North,” “developing,” and “developed” can be problematic and subject to debate. In this context, the term “Western” is used to describe the cultural, economic, and socio-political contexts of Europe, North America, and parts of Australasia, which have been heavily influenced by a predominantly capitalist and neoliberal worldview.

⁶ <https://www.iea.org/topics/climate-change>

⁷ Similarly, Dunlap and Tornel [33] criticize Sovacool et al.’s article [32] affirming that it “still reads as if it is trying to integrate these critical or rebellious positionalities into the dominate framework of modernist

Therefore, we argue that ecofeminist approaches should not be included as an afterthought into an existing framework such as energy justice. On the contrary, ecofeminist analysis and critique should become an additional framing for discussion of energy discourses. The main reasons we believe that ecofeminism appears particularly suitable for addressing the conception of energy and its socio-ecological implications lie in its longstanding, (1) analysis of hierarchical value dualisms such as human–nature (see Sect. “[Main text](#)”) and (2) critique of seemingly neutral conceptions that shape narratives about the past, present, and future [42]. Regarding energy as a resource and commodity, we argue that narrow, economically driven understandings of energy predominantly inform techno-fix solutions and narratives for addressing socio-ecological crises. These narratives may disregard the perspectives and interests of many marginalized human and non-human beings, thus worsening socio-ecological crises [40]. The problem with the commodification of energy is that in practice it means the commodification of nature, or the reification of the non-human world. The premise of this study is that there is a need for more critical lenses (such as ecofeminism) within the existing energy social science and humanities studies and energy research, broadly construed.

Situated at the crossroads between environmental and energy ethics, this article aims to provide a missing link [43] between the conceptual tools offered by ecofeminist authors like Gaard and Plumwood and a particular conception of energy that seems to affect the human–nature relation. In doing so, the article aims to deepen the relationship between environmental philosophy and energy social studies.

The article is developed as follows: in Sect. “[Main text](#)”, first the ecofeminist theoretical background is presented and connected with energy issues. Second, the specific theoretical contributions of Gaard and Plumwood are used to address the research question. Following these accounts, we argue that backgrounding, instrumentalism, incorporation, and hyper-separation [41] of nonhuman nature as well as some human groups work through the understanding of energy as a distinct, and indispensable product, resource, or commodity for human needs and socio-economic development. For instance, by placing emphasis on energy as a substance, or as a commodity

to trade and consume, parts of nonhuman and human nature are confined to the background, thus making them ready to be instrumentalized. In Sect. “[Conclusions](#)”, we draw our conclusions.

Main text

Towards an ecofeminist perspective in energy studies

Ecofeminist theoretical background

In this section, we introduce the perspective of ecofeminism, an important area of scholarship that has emerged within environmental philosophy since the 1970s [44] and has also functioned as an “activist and research movement” [45]. We present some of the characteristic themes explored by ecofeminists and briefly address the connections to energy research. This serves as an overview to discuss how Greta Gaard’s and Val Plumwood’s ecofeminist analyses of the hierarchical dualistic logics behind the human–nature relation help address the conception of energy as a resource and commodity.

Ecofeminism includes various perspectives and schools of thought, so it is better to refer to “ecofeminist approaches” [44] instead of assuming a uniform set of ideas common to a supposed unified ecofeminist view. The term “ecofeminisms” [46] acknowledges the diversity and richness of perspectives. Scholars in this field have discussed how ecological issues should be viewed through a gendered lens and have specifically focused on the relationship between women and nature. Some ecofeminists have privileged analysis based on socio-constructivist and materialist approaches, arguing that the oppression of women and nature is linked to the roles and activities typically performed by women in certain societies and economies, such as nurturing and caring [47].⁸ During the 1990s, some ecofeminist scholars moved from examining the links among oppressed groups to tackling the underlying reasons for structural oppression [50]. In this article, we draw from these developments and consider this theoretical shift as the cornerstone of our approach.

Ecofeminist themes intersecting energy issues

Ecofeminist thought considers non-human nature as a feminist issue and investigates the interconnections between gender, nature, race, species, and class intended as intersectional dimensions. The core premise of ecofeminism is that “how we treat nature and how we

Footnote 7 (Continued)

energy development [32]. It is also striking to note that Dunlap and Tornel denounce that “[f]rom a liberal governance perspective, feminism, Indigenism and anti-racism [...] are not simply condemned anymore, but can be managed, inserted into a system of political utility, extractive development and regulated for the ‘greater good’ of economic growth and development” [33].

⁸ Some early ecofeminists focused their efforts on supposed feminine/biological qualities and attitudes of women which would make them inherently closer to nature. This conceptual movement—rooted in the desire to positively evaluate what had been traditionally devalued in Western society—has been strongly criticized and charged with essentialism especially by some feminist philosophers [48], who claimed it relegated women to the natural sphere, thus reaffirming what most feminists were condemning. Along with the essentialist critique, others have been developed, such as those of biologism and “utopianism” [e.g., 49].

treat each other are inseparably linked” [50, p. 158]. In the context of energy consumption, focusing on intersectionality allows for a comprehensive understanding of the experiences of marginalized groups, whose various forms of oppression intersect both theoretically and practically [45]. This perspective can be applied to explore energy injustices, such as those related to the use of cookstoves in the Global South, which are particularly detrimental to the environment, and also to women’s health due to their social roles [51]. Ecofeminism could contribute significantly to energy social studies by highlighting the marginalization of women’s care practices and roles [47, 52, 53]. This marginalization is often reflected in energy consumption patterns and related problems. Research indicates a gendered aspect of energy poverty, as women are mostly responsible for household chores, and are more exposed to energy poverty [54–57].⁹ Furthermore, ecofeminism can contribute to the examination of power dynamics and how they can exclude, subjugate, or empower individuals [62] in the energy sector. Energy is a form of power, that can create dependencies [43] and hierarchies on a wide range of levels (e.g., geopolitical level). Ecofeminism has long examined power dynamics and social structures as well as understanding how different forms of oppression are linked. The analysis of power relationships seems an essential step in addressing social and environmental issues. The centrality of such an analysis seems to be demonstrated considering that some energy research scholars have started to explore content and attitudes that resemble ecofeminist themes. For example, there is a growing literature stressing the importance of (network of) relationships and hierarchies within socio-technical energy systems [e.g., 28, 31, 63], and some studies, for instance Damgaard et al., challenge individualistic frameworks associated with energy choices and responsibilities, moving towards “[r]elational understandings of energy systems and a language of interconnectedness” [64].

Another valuable contribution of ecofeminism to energy studies is its critique of technological optimism. The energy transition is today considered the most feasible way to address environmental issues, shifting from old to new energy resources. This shift emphasizes new energy technologies and infrastructure, while behavioral changes and social practices affecting energy consumption remain secondary [65]. However, the general belief that this process is just a technological one is today extensively criticized [66, 67]. On an ecofeminist account, environmental problems cannot be simply resolved by

modernizing existing polluting technologies. The criticism is that overoptimistic narratives about (energy) technological progress fail to recognize how ecological problems are deeply rooted in Western ways of conceptualizing relations and subjects.¹⁰ Promoting (energy) technological solutions as if they were the *only* reliable solutions—that is embracing technological determinism—may deny and marginalize alternative trajectories or solutions.

Finally, ecofeminism addresses the core issue of this article (e.g., the understanding of energy and its implications for the relationship between humans and nature) by examining the “value dualisms” [52] typical of Western thought, such as the nature–human dualism.¹¹ A “value dualism” is a dualism that historically formed part of the foundation of how Western culture views the world [41, 62].¹² These dualisms are not merely paired opposites but hierarchical, with one term valued over the other. Ecofeminism argues that hierarchical value dualisms result in the oppression and domination of the subjugated term (e.g., male–female).

By challenging these dualisms, ecofeminism offers a critical framework for understanding and addressing the interconnected oppressions affecting both humans and nature.

In the following, we focus on the human–nature relation and explore the application of Gaard’s and Plumwood’s analyses to the conception of energy as outlined in Sect. “Background”.

The “Energy–Nature” relation through an ecofeminist lens: applying Gaard’s and Plumwood’s critiques

Reiterating our research question, *Does the conception of energy as commodity and resource affect the relation between humans and nature? If so, how?* we now provide a response to by focusing on the specific ecofeminist contributions of Greta Gaard and Val Plumwood.

Among ecofeminist scholars, Greta Gaard explores the connections between the treatment of women, nature, indigenous people, and water by chasing the distribution processes of energy in North America. In her article *Women, Water, Energy* [62], she identifies a series of

⁹ Ecofeminism has contributed also to the development of care ethics [58, 59]. Although care ethics still represents a minority voice in energy social sciences, in the last few years there have been a few attempts to contribute in this direction [43, 60, 61].

¹⁰ For example, the optimistic outlook on technological innovation put forth by eco-modernists (see, e.g., [68]) seems short-sighted when considered through an ecofeminist lens [42].

¹¹ In ecofeminist terms, nature is a concept that includes entities and beings that are often undervalued. Interestingly, to this category belong not only non-human beings but also marginalized human groups, stressing that the term “humanity” should be used to denote only those human beings in positions of power rather than the entire human species [41, 69].

¹² The relationship between humans and nature is at the core of any environmental ethic. Moreover, the separation of humans from the rest of nature has been interrogated by many scholars adopting different conceptual lenses, including Bruno Latour [70], Jason Moore [71], and Philippe De Scola [72].

tendencies among energy companies' conduct. Examples of these trends are: siting their power plants in rural areas, depleting water reservoirs, polluting the environment, harming local people's health, and then supplying energy to wealthy urban populations [62]. Through the adoption of Val Plumwood's [41] critique (see below), Gaard shows many overlapping and veiled associations [or linking postulates, in Plumwood's terms, 41] among the condition and consideration of water, women, indigenous people, and some socio-economic social groups. Gaard considers the energy system as emblematic of realizing how environmental sexism, environmental racism, and environmental classism take place as interwoven phenomena. She identifies a "linear model" through which the relation between energy and nature is displayed in the conversion and distribution of energy, and writes:

"[A]s inhabitants of Western culture we are conditioned to think about water [...] and about power. Our conception of power and energy, as well as our relationship to water, is based on a linear model that is now showing itself to be not only inaccurate but life-threatening. This linear model is based on the assumption that energy can be continuously extracted from nature—from water, from poor people, from people of color, from women [...]. In the linear model of power production, energy is extracted, distributed, consumed, and in the process, wastes are produced" [62].

This linear model relies on a "conception of power and energy" as well as on a specific "assumption" concerning energy. We note that the conception of energy Gaard criticizes is similar to the conception of energy as a commodity and resource for humans highlighted in the "Background" section of this article and largely used in engineering and economic practices: A commodity that is crucial in mediating the human–nature relation. Drawing on Plumwood's critical lens, Gaard tracks the root of current environmental problems to the extractivist and nature-subordinating linear model operating in Western thought. On top of this aspect, we stress how the very conception of energy as a commodity contributes to reinforcing and reproducing continuously the mindset of the linear model. We underline that this peculiar and not-neutral conception of energy influences Western narratives and may contribute to worsening or exacerbating the ecological crises. Among ecofeminists, Val Plumwood's [41] critique is emblematic of such potential. According to her analysis, the multiple forms of oppression experienced by different human groups (e.g., women, some indigenous groups, marginalized people, etc.) and other parts of nonhuman nature

(e.g., nonhuman animals) are interlocked under the same oppressive conceptual structure. Plumwood describes this structure based on a logic of dualisms that are hierarchically ordered. In her explanation of how hierarchical dualisms work (cfr. Section 2.2), Plumwood introduces the components of the "logical structure of dualism" [41] that make it possible to devalue one of the two terms of any dualistic relation:

- 1) Backgrounding (denial of dependence and/or existence).
- 2) Radical exclusion (hyperseparation).
- 3) Incorporation (relational definition).
- 4) Instrumentalism (objectification).
- 5) Homogenization.

One of the key pairs she proposes is the so-called "human-nature" dualism (see above).¹³ According to Plumwood, this dualism informs and shapes Western thought in a way that contributes to backgrounding nature, denying human dependency on it, and hyperseparating it from humans. Nature is defined by its relation to humans who are then able to instrumentalize and homogenize it.

We propose that the conception of energy as a commodity and resource for humans implies and reinforces the "logical structure of dualism", thus denoting a certain energy-nature relation. Conceptualizing energy as a commodity backgrounds the subjects who are directly and indirectly affected in the process of energy conversion, distribution, and consumption. In the background of these processes, there are people working in cobalt mines; there are dislocated villages for the extraction of lithium [73]; there are heavily impacted biotic and abiotic components of ecosystems. When energy is conceptualized merely as a resource and commodity for humans, a third element is introduced between "human" and "nature" in the form of a (material) substance of its own.¹⁴ Paradoxically, energy as a commodity contributes also to the incorporation (relational definition) of nature into the sphere of humanity (as a sort of possession) because some parts of nature become predominantly depicted through the energy needs of humans.¹⁵ Wind, water, sunbeams, plants, and lands became primary energy sources, forms of fuel with some qualities

¹³ "I argue that Western culture has treated the human-nature relation as a dualism and that this explains many of the problematic features of the West's treatment of nature which underlie the environmental crisis, especially the Western construction of human identity as 'outside' nature" [41].

¹⁴ [Cfr. on the substantiation of energy, [13, 29, 74].

¹⁵ "The definition of the other in relation to the self as a lack or absence is a special case of incorporation, defining the other only in relation to the self, or the self's needs and desires." [41].

which make sense only if associated with the conception of energy (renewable, clean sources, etc.) Finally, as a “corollary” [41] of these three characteristics of dualisms (backgrounding, hyper-separation, and incorporation) there is the instrumentalization of nature. This applies to the commodified parts of nature that are necessary to obtain energy (i.e., plants, animals, ecosystems) as well as those that are not commodified yet (i.e., human beings who are in different ways and extents involved in energy extraction and similar processes). Both, nevertheless, are taken for granted in meeting the stupendous growing energy demand [75]. Conceiving energy as a resource and commodity for humans reinforces and reproduces the human–nature dualism, along with a hierarchy of values. From an ecofeminist point of view, in this hierarchical and oppressive structure (or “linear model”, in the words of Greta Gaard), narrow anthropocentric assumptions which reduce nature primarily to a resource thrive, thus contributing to the exploitation of and domination over nature and the exacerbation of existing environmental issues. The key critical contribution of the ecofeminist analysis consists in showing that both other-than-humans and some humans are backgrounded, instrumentalized [41] for the sake of energy extraction and provision, and disregarded. In this way, the ecofeminist critique assumes that some human groups are more responsible than others for causing environmental harms [76]. Meanwhile, it highlights that some other human groups are threatened in a way similar to non-human beings and entities, thus stressing that dualistic logics and structures oppress some humans too and that humans, overall, should be understood as being part of nature.

Addressing the research question above by relying on an ecofeminist account, we believe that a narrow socio-economic conception of energy as a resource and commodity for humans does indeed affect the human–nature relation, and it does so by reinforcing the “logical structure of dualisms”. The predominance of this energy conception shapes public narratives, discussions, and academic discourses about energy. We suggest that this view, along with its assumptions about nature, limits alternative narratives and pathways for current and future energy transitions. Accordingly, this dominant energy perspective influences how people envision their individual and collective responses to the various environmental challenges and crises.

Conclusions

This theoretical article focuses on conceptions of energy. We suggested that energy is not one single neutral term transcending socio-cultural and economic contexts, but it is used with different meanings and through various expressions and this usage of the term affects how

we view the world and us as human beings in it. In Sect. “Background”, we focused on a conception of energy primarily seen through the prism of economics and markets: something to commodify and monetize; something that humans must necessarily pay for, extract, generate through conversions, manage, use, and conserve before eventually disposing of it.

Adopting an ecofeminist analysis and critique, this article argues that the conception of energy as a resource and commodity for humans may affect the human–nature relation. According to this understanding, energy would be a resource or a product that originates primarily outside of the human sphere, something that humans exploit, extract, transform, consume, use, manage, regulate and, in any case, rely on. The problem with this way of conceptualizing energy is not that energy can be used as a resource for human needs. The issue is that when this understanding of energy as a resource or commodity is the only or predominant one, it contributes to excluding some other parts of nature (human and nonhuman) that are directly or indirectly affected (i.e., natural entities and beings). What is crucial is that such a conception of energy becomes part of and predominant within the narratives created by various actors and institutions that deal with energy and environmental issues (see Appendix 1 for example EU energy policies). These narratives may in turn influence and shape different (public) debates (e.g., geopolitical discussions, energy research in social sciences) and have practical implications in terms of public policy, practices, and actions (e.g., justification of energy projects, energy poverty measures). Hence, such a conception of energy may contribute to worsening existing environmental issues.

We drew from Gaard’s and Plumwood’s analyses of the “logical structure” of hierarchical dualisms and indicate that when energy is conceptualized as and therefore assumed to be a resource and commodity for humans, there is a risk of reinforcing narratives in which parts of nature and some humans are neglected, backgrounded, separated from what we perceive as (more) valuable, dependent in their very definition on human needs (incorporation), and instrumentalized.

This ecofeminist analysis and critique may help energy humanities and social science scholars to acknowledge and highlight gender, race, indigenous, and species inequalities, and the power imbalances embedded in and constitutive of socio-economic and political energy transitions. But is it possible to move beyond a conception of energy as a resource and commodity for humans? What would that entail theoretically and practically? Addressing these questions could be the next step of this research. The aim of this article is not to offer an alternative ecofeminist conception of energy but rather an

Table 1 EU policy documents

#	Year of publication	Author(s)	Code	Title of the communication
1	2018	European Commission	COM (2018) 97 final	Action Plan: Financing Sustainable Growth
2	2018	European Commission	COM (2018) 773 final	A Clean Planet for all. A European strategic long-term vision for a prosperous, modern, competitive, and climate-neutral economy
3	2019	European Commission	Rulebook Publications Office of the European Union	Clean Energy For All Europeans Package
4	2019	European Commission	COM (2019) 640 final	The European Green Deal
5	2020	European Commission	COM (2020) 102 final	A New Industrial Strategy for Europe
6	2020	European Commission	COM (2020) 299 final	Powering a climate-neutral economy: An EU Strategy for Energy System Integration
7	2020	European Commission	COM (2020) 456 final	Europe's moment: Repair and Prepare for the Next Generation
8	2020	European Commission	COM (2020) 474 final	Critical Raw Materials Resilience: Charting a Path towards greater Security and Sustainability
9	2020	European Commission	COM (2020) 562 final	Stepping up Europe's 2030 climate ambition Investing in a climate-neutral future for the benefit of our people
10	2021	European Commission	COM (2021) 550 final	'Fit for 55': delivering the EU's 2030 Climate Target on the way to climate neutrality
11	2022	European Commission	COM (2022) 230 final	REPowerEU Plan

invitation to consider an ecofeminist analysis and critique as a helpful approach in framing public narratives and discussion about energy as well as academic discussions, discourses, and research in a more radical, critical, open, and less oppressive manner. Although more research is needed to craft energy narratives, we agree with Mitcham and Rolston when they conclude: "Are there not other perspectives from history to art, poetry, psychology, and religion that could further de-constrain and enrich the way people think about energy?" [36]. The idea we have presented in this article is that a well-affirmed energy conception affects narratives within policies and beyond. To the end, we recommend working on the power of alternatives and marginalized narratives to help question and deconstruct long-standing theoretical assumptions which may have tremendous practical implications.

Appendix 1

Methods and data selection procedure

As mentioned in the article, we assume that there are other conceptions of energy at play in different domains that are not identical to the scientific one, even though they may be indirectly connected to it. In the article we focused on the conceptualization of energy as "a resource and commodity for humans". In this appendix, we are interested in identifying whether there are linguistic instances in EU policy documents that correspond to the

"tendency to conceptualize energy as a generic resource" [37] and as a commodity for human beings.

In order to investigate this hypothesis and provide evidence for the theoretical claims that follow in the upcoming sections, we turn to the specific yet influential domain of energy policy produced by EU political bodies. To exemplify this, we conducted a discourse and content analysis of 11 EU documents that have been published in English since the Paris Agreement (2015) (see Table 1 in the Appendix). We searched for linguistic expressions, coded them according to both inductive and deductive categories and then interpreted the results.

We decided to focus on the European level energy policy discourse primarily because—as the analysis repeatedly revealed—the EU claims to play a leading role in the energy transition, welcoming the fact that its own direction in energy policy matters "has now been followed by other countries all over the world" [77]. The selected documents are primarily EU communications¹⁶ that provide the latest strategies and pathways to achieve the objectives of the Paris Agreement. Moreover, all these documents discuss energy-related issues and emphasize the importance of transitioning to cleaner and renewable energy sources. Each communication presents different aspects of energy transitions within the European context: from those explaining the EU's energy transition strategies in general (i.e., the 13 legislative proposals that

¹⁶ An EU Communication evaluates, clarifies, and interprets policies, provides frameworks for interpretation, notifies of concrete measures, and initiates policy debates without creating new policies or directly affecting member states. Cfr: <https://www.eumonitor.eu/9353000/1/j9vvik7m1c3gyxp/vh7dtp45uyn>.

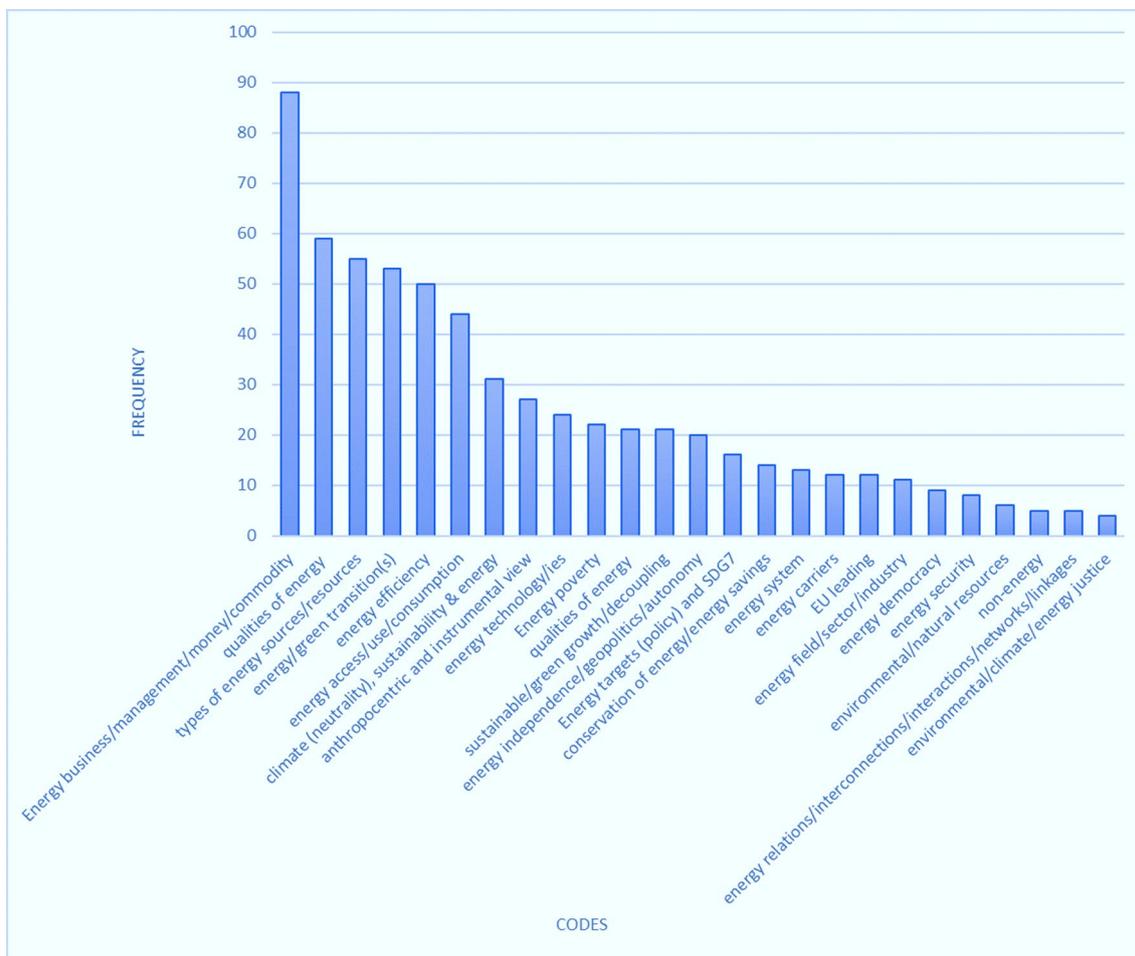


Fig. 1. 25 codes created through a discourse and content analysis

make up the “Fit for 55” package [27] or the European Green New Deal [78] to those responding to particular energy transition challenges (e.g., the transition in the financial and industrial sector or the issue of raw materials), to those framing the energy transition in a specific historical moment (e.g., specific measures during the pandemic, 2020, or the REPowerEU Plan, 2022, in the aftermath of Russia’s invasion of Ukraine).

We used Atlas.ti to analyze the 11 documents. We searched the most salient occurrences of the word “energy” within various expressions and combinations (e.g., “energy efficiency”; “energy poverty”; “renewable energy”; “sustainable energy”). However, we did not code certain occurrences when they were irrelevant (e.g., when the term “energy” was coupled with “policy” in the expression “energy policy”) or when it occurred repeatedly in the same passage with an identical meaning. We created 25 different codes for the most salient and frequent energy-related linguistic expressions present in these documents (see Fig.

1). The majority of these codes were created a priori based on our previous knowledge and intuition, others emerged from in-depth reading of the documents (i.e., they are the result of additional meanings we did not anticipate but found while analyzing the texts). Some codes were clustered together when occurrences and expressions seemed to refer to the same essential meaning. For instance, we clustered expressions such as “energy bills”, “energy costs”, and “energy markets” under the label “energy business/management/money/commodity”. Our selection does not aim to be exhaustive but rather to illustrate how a certain conception of energy might be present and influence certain narratives and discourses and consequent decision-making and actions.

Interpretation of the discourse and content analysis

Mapping the results of the analysis, we suggest that at least in the EU energy policy documents considered, energy is primarily viewed as a resource and commodity for human use and benefit. Although the scientific definition of energy as “the ability to do work” does not seem to play a central role in these documents, in a few instances the term energy is used in the technical sense of physics or engineering. However, the centrality of “energy efficiency” seems mostly to relate directly to the EU’s promotion of the “energy efficiency first principle”. Another significant finding is that many expressions contain the term “energy” either in the form of an adjective combined with a noun (e.g., energy resource) or in association with another noun (e.g., energy poverty). Sometimes they denote things (e.g., renewable energy, energy sources, energy costs, energy technologies), other times they refer to processes or activities (e.g., energy transitions, energy extraction, production, distribution, and consumption, waste), or even contexts (e.g., expressions such as “energy sector,” “energy field,” and “energy industry”). However, when we try to spell out what energy really means in these cases, we fall back on the various conceptions of energy that are assumed in the background, which seem to not correspond only to the scientific notion of energy. Therefore, one may ask: what is the “energy sector”? What do we mean by “energy sources”? What is actually included under “sustainable energy? Moreover, the predominant narrative frames the energy transitions mostly as an economic affair (e.g., “clean and fair energy transition [...] creates growth and jobs in a modern economy”, see [77]). Numerous sentences suggest that the transition to “cleaner and smarter energy” is meant to benefit humans in different ways: “cleaner and smarter energy will mean improved health, a better quality of life and will allow citizens to take their own decisions regarding their energy use”; or “The clean energy transition must benefit everyone—no citizen, no region should be left behind” [77]. A major assumption and implicit goal is that the European energy transitions will rely on alternative “cleaner and smarter energy” sources and technologies. This would ensure that European economic growth could continue increasingly decoupled from ecological impacts, hence separated from a stringent dependency on nature. Interestingly, the idea that economic growth based on advanced technological developments can be brought about decoupled from an increasing human ecological footprint constitutes the basis of the ecomodernist narrative [68].

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Author contributions

NC and GF read, analyzed and interpreted the data regarding the 11 EU energy policy documents. NC performed the analysis of the data through Atlas.ti. All authors contributed to the conceptualization of the article. All authors read and approved the final manuscript.

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