



## Energy Ethics, Justice and SDG7

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### Definitions

#### Energy Ethics

**Definition 1** (descriptive): *The study of how different human groups relate to energy depending on their cultural traits and geographical contexts. It includes the study of different worldviews and perspectives on energy, often described as a cultural construct. It describes the various ways in which human beings approach and experience energy infrastructures and technologies, detailing their cultural values and moral preferences and highlighting their situated, lived experience. Typically adopted by historians and social scientists (i.e., anthropologists, sociologists).*

**Definition 2** (prescriptive): *The philosophical study of the moral dimensions of energy related matters as a systematic theoretical investigation that analyzes energy systems, policies, and*

*actions, evaluates stakeholders' values, judges the ethical worth and merit of energy-related actions (i.e., good/bad, right/wrong), and prescribes preferable or optimal courses of action in both general and specific situations. Normative energy ethics aims to build arguments that may support specific energy choices, actions and decisions. Typically privileged by philosophers (ethicists), theologians, and practitioners interested in normative analyses and outcomes.*

#### Energy Justice

**Definition 1** ("Tenets-based"): *The study of the justice aspects of energy transitions by using an ethical framework that stresses the importance of different types of justice – especially distributive, procedural, and recognition, but also restorative, participative, and their cosmopolitan nature – in order to understand and assess the justice dimensions of energy issues and provide moral guidance in decision-making.*

**Definition 2** ("Principled"): *The study of the justice aspect of energy transitions by using moral principles such as availability, affordability, due process, transparency and accountability, sustainability, intragenerational equity, intergenerational equity, and responsibility for understanding and assessing the justice dimensions of energy issues and providing moral guidance in decision-making.*

*Both perspectives in Energy Justice research are typically preferred by policy-oriented scholars and energy practitioners interested in*

*analyzing, assessing, and implementing just energy transitions.*

## **Introduction. Ethical and Epistemic Dimensions of Energy**

Human beings typically experience energy within complex sociotechnical systems, namely through interactions with infrastructures, technologies, and policies. At the same time, the human relationship to energy (primarily experiences within built environments) cannot escape its linkage to and dependence on natural environments. For more than 200 years, and for legitimate reasons, the study of energy has been the monopoly of the natural sciences and engineering. Especially over the past three decades, however, scholars in the social sciences and humanities have begun to explore the topic of energy according to their own approaches, interests, and methodologies. Such intellectual activities stem from the realization that energy, like climate change, is not only a technical affair. In fact, the ongoing energy transitions from fossil fuels to alternative sources, for example, raise significant questions of ethics and justice (Miller 2014). Moreover, these complex transformations imply psychological, behavioral, gendered, religious, spiritual, historical, socio-economic, and sociopolitical aspects that are sometimes hidden or tend to be considered only secondarily. Given these premises, many scholars have suggested that the social sciences and humanities should integrate these and similar topics related to energy into their research agendas. This task is often carried out by fostering interdisciplinary and transdisciplinary collaborations. Especially in the case of normative approaches, the general aim is to attentively scrutinize and study the “human” and “social” components of energy transitions in order to offer ethically appropriate recommendations for improved outcomes. Although challenging, this task is deemed essential to achieving a better account of energy or, more ambitiously, a more holistic understanding of both the role of energy in human life and the ethical and epistemological requirements of so-called just transitions.

For a brief look at how the social sciences and humanities, and philosophy in particular, may contribute to the energy transitions debate as well as to the attainment of Sustainable Development Goal 7 (SDG7), consider these two facts. First, the United Nations Development Programme (UNDP) reports that in 2017, one in seven people, most of whom live in rural areas of the developing world, still lacked access to electricity. But because services dependent on electricity access are deemed more and more essential to attain human development and basic capabilities, this fact raises questions of fairness and responsibility. Second, as of 2018, 40% of the world’s population, about 3 billion people, still relies on unhealthy, polluting fuels for cooking. This fact also begs fundamental ethical questions especially considering that appropriate nutrition and good health are, again, fundamental not only for survivorship but also for human flourishing. These and many other similar examples show that while energy transitions continue to provide puzzles for natural scientists and engineers, they also raise many important questions related to ethics and justice, which call for more systematic investigations.

Since the 1970s, several studies have confirmed the existence of an important correlation, at least up to certain thresholds, between the amount of per capita energy use and human well-being (Martínez and Ebenhack 2008). Despite possible criticisms (see Arto et al. 2016), these studies confirm the crucial role of energy access and thus reinforce the mission of SDG7. However, focusing solely on the amount of energy consumed by individuals can be deceiving because energy in itself is not what people value. In practice, human beings need access to adequate, reliable, high-quality, affordable, sufficient, sustainable, and modern energy services. This access is widely recognized as not only a fundamental step toward alleviating energy poverty but a crucial prerequisite for economic, cultural, and social development in complex societies. Many new areas of research currently study these and other aspects – for example, energy politics, energy democracy, and energy equality.

Although these other perspectives offer interesting and promising avenues of research, this entry focuses on two main areas of scholarship that have emerged within the humanities and social sciences: *Energy Ethics* and *Energy Justice*. The emerging field of Energy Ethics (a.k.a. Ethics of Energy) is concerned with the moral implications of energy transitions, such as moral dilemmas involved in particular actions, choices within energy projects or the role of values in the design of energy infrastructures and technologies. Although sometimes it is difficult to draw a clear distinction, scholarly efforts in Energy Ethics tend to primarily follow either a descriptive or a normative approach. Descriptive accounts typically include historians of energy, social scientists, and a variety of intellectuals, including artists. In contrast to such descriptive views, normative approaches to Energy Ethics tend to be preferred by moral philosophers, applied ethicists, and intellectuals in the field of religious studies, such as theologians. The second area of energy research concerned with ethical issues that will be discussed below is *Energy Justice*. Although it has emerged only during the last decade, the scholarship in this field has already grown exponentially and has been considerably influential in the energy transitions debate.

## Energy Ethics

Especially since the 1970s, many disciplines can be said to have contributed to Energy Ethics. This section focuses only on two main groups of intellectuals: on the one hand, historians, social scientists, and other scholars as key representatives of a (primarily) descriptive approach, and on the other hand, philosophers and other intellectuals who exemplify normative accounts of Energy Ethics. An overview of scholarship regarding metaphysical and ontological perspectives on energy as well as references to academic courses, conferences, interdisciplinary projects, and policy outcomes related to both descriptive and prescriptive Energy Ethics can be found in an extensive literature review (Frigo 2018a). Before we delve into the different approaches to Energy Ethics, it is

important to clarify that there is a sharp distinction between social scientists and philosophers in the use of the term “ethics.” In the social sciences, ethics tends to be a subject or topic of investigation whereas ethics in philosophy usually refers to the discipline that systematically investigates and analyzes moral conduct through the tools of meta-ethics, ethical theories, and normative Moral Philosophy in order, often but not always, to provide moral guidance or prescriptions through argumentation.

## Descriptive Energy Ethics

### History of Energy

Among the concepts studied by historians of science, energy occupies a special place. Several historians of science have studied the evolution of the scientific notion of energy from antiquity to the present day (Cardwell 1967; Lindsay 1971; Harman 1982; Coelho 2020). Others have offered historical accounts of how sources and forms of energy as well as technologies have influenced various human civilizations over time and in different contexts (Smil 2017; Rhodes 2018). While some of these and similar works suggest that ethics is deeply connected to energy, they are concerned primarily with the role of energy in the evolution of human civilizations. Although often present “between the lines,” ethical aspects have usually remained peripheral to this sort of investigations.

### Anthropology and Ethnography of Energy

In general, social scientists have focused on the relationship between energy, technologies, and social practices (Shove and Walker 2014), in accordance with the idea that “energy is of little use in and of itself. It must pass through a socio-technological system in order to reach the site of its intended use” (Wilhite 2005: 1). Both sociologists and anthropologists aspire to study energy systems as energy cultures (Pfister et al. 2017) by using quantitative and qualitative methods (see, e.g., the special issue Goodman and Marshall 2018). It is often remarked that, in the English-speaking world, the social sciences began to engage explicitly with the topic of energy

in the 1940s. Exemplary in this regard is White's *Energy and the Evolution of Culture* (1943). Although his cultural-evolutionist position was later criticized, his perspective influenced a first generation of social scientists who, often using different theoretical frameworks and methods, investigated the role of energy in shaping human societies and cultures (Cottrell 1955; Adams 1975).

According to Boyer (2014), a second generation of social scientists working on energy emerged in the 1970s and 1980s, bringing "energy into wider debates over the rights of indigenous communities, environmental impacts, and resource exploitation, debates that remain central features of the anthropology of energy today" (313). This period saw the development of both the Sociology of Energy (e.g., Rosa 1988) and the Anthropology of Energy. While the former favored large data collection and quantitative methods, the latter adopted ethnographic methods such as interviews and participative observation within with smaller group samples, utilizing "a long-time perspective in which context is crucial" (Nader et al. 2010). As anticipated above, this period was also characterized by several studies of the relationship between energy use and various notions of well-being, such as lifestyle (Mazur and Rosa 1974) or quality of life (Nader and Beckerman 1978; Alam et al. 1991). Since then, this type of investigation has continually been debated and refined (Martínez and Ebenhack 2008; Arto et al. 2016).

Since around 2010, there has been a new boom in social science scholarship on energy, or what has been called a "third wave" of scholarly engagement. The creation of new journals (e.g., *Energy Research & Social Science*, established in 2014) as well as multiple edited volumes and seminal collections (Rüdiger 2008; Strauss et al. 2013) have made this a diverse and polyphonic field. Interestingly, these new undertakings blur the lines between descriptive and normative accounts discussed above. For example, Strauss seems to suggest an interesting tendency toward normativity when she writes that "because of the necessity of institutions to manage energy flows, and because of the necessity of energy flows to

individual agency, an anthropology of energy is necessarily political" (11–12). And yet, most social scientists tend to defend a descriptive approach in the study of energy. In the editorial of a recent special issue anthropologists Smith and High (2017) write that, given the "conceptual orientation of anthropology, our calling for attention to energy ethics does not involve the scholar making a priori assumptions about what constitutes a good life, a good community, a moral person and the like. This is not an exercise in which scholars impose their own moral views on to those we study. Rather, it is a call for us to be cognizant of the moral aspects of social life as it pertains to matters of energy." A similar tone is echoed in a more recent collection of studies edited by the same scholars in which they and others explore "the ethical constitution of energy dilemmas" (High and Smith 2019). Here, High and Smith are particularly critical of those scholars who "have often exerted unreflexive judgement on what the place of energy in human life *should* be, which energy sources are *good*, and whose conduct is *wrong*" (13, Italics in the original). They suggest that "'ethical worlds' are multiple and overlapping, sometimes in mutual accordance and other times at odds, demonstrating why it is important to think of energy ethics in much more capacious ways" (10–11).

Finally, important contributions to this field are found in the recent attempts to highlight the gendered dimensions of energy generation (Łapniewska 2019; Wiese 2020), including, for instance, the crucial topic of energy access (Pueyo and Maestre 2019; Winther et al. 2020). These and similar publications show a growing awareness of the pressing issue of energy poverty and stress, for example, the gendered impacts of pursuing SDG7 (see also UNIDO and UN Women 2015). In sum, the perspectives adopted by social scientists are rarely explicitly normative. Rather, they attempt to look beneath the surface of contemporary energy debates, to gain a comprehensive but nuanced view of the ideas, values, and preferences that are fueling different individuals' and groups' lived experiences and understandings of energy and the environment (i.e., energy ontologies). The bottom-up approach taken especially

by anthropologists of energy is particularly illustrative of this orientation as it presents people's concrete energy practices and daily challenges.

### Energy Humanities

Especially over the past decade, some "third wave" energy social scientists along with writers, poets, and artists have been cultivating the innovative field of energy humanities to offer alternative and creative ways of looking at the topic of energy. Mirroring similar developments in environmental humanities, intellectuals working in energy humanities employ literature in the form of poetry, novels, comics, and essays, as well as "hybrid" experiments with other media such as photography and film. Like some anthropologists of energy, these intellectuals are concerned with delving into the muddy waters of "energy cultures." Although a sharp distinction between the two fields might be unnecessary, energy humanities can be characterized as those contributions that do not necessarily employ specific scientific methods of inquiry (which are central to social sciences). Rather, they utilize the tools of investigative journalism, the literary acumen of novelists, or the mesmerizing charm of poetry to tackle the conundrums of energy transitions. As indicated above, they sometimes change the game altogether by rejecting the written format and embarking on innovative experiments through audio-visual and performative arts. The novelty of energy humanities resides, perhaps, in these uncommon, original ways of shedding light on untold stories and ontological nuances of energy. For example, Farca's *Energy in Literature* (2015) is one of the richest collections of such exercises. This anthology collects twentieth- and twenty-first-century poems, critical essays, and photographs that deal with different sources of energy or concentrate on issues of pollution, waste, or extraction. Foundational work in establishing this as an academic field was the creation of the Petrocultures Research Group based at the University of Alberta and, among others, by Boyer and Szeman (2014), who also coedited the second anthology in the field after Farca's (Szeman and Boyer 2017). Although more recently several energy scholars have begun to focus on renewable

energy systems, for a long time, many of the contributions in energy humanities focused primarily on so-called "petrocultures" and so, as yet, fossil fuels have probably been overrepresented in this field (LeMenager 2014, with further references).

### Normative Energy Ethics

Scholars who embrace a normative approach tend to propose that the goal of a moral inquiry regarding energy is not just to describe cultural values and stakeholders' moral preferences. Instead, these scholars contend that Energy Ethics should be approached as a systematic theoretical investigation that is able to *analyze* energy systems, policies, and actions, *evaluate* stakeholders' values, *judge* the moral worth of energy-related actions (i.e., good/bad, right/wrong), and finally *prescribe* preferable or optimal courses of action in general or specific situations.

### Ethics and Moral Philosophy

Possible antecedents of a normative Energy Ethics are rare and sometimes appear in disguise, meaning that work with ethical significance may not be explicitly labeled as "ethics" or "philosophy." Although it is not simply derivative from them, normative Energy Ethics resembles Environmental Ethics and shares characteristic traits of inquiry with other disciplines such as Ethics of Technology and Society and Technology Studies (STS). To date, while the landscape of normative Energy Ethics has been quite varied, it is distinguished by the fact that it embraces the perspective of philosophical ethics (i.e., Moral Philosophy). Most of the initial work was devoted to energy in connection with the concepts of equity (Illich 1974), responsibility (Dernbach and Brown 2009), and the fundamental problem of obligations to future generations (Wenz 1983). Meinhold's edited volume presents several studies about the ethical dimensions of energy with a particular focus on the ASEAN region (2016). A recent interdisciplinary attempt to merge the approaches of Anthropology and Philosophy of Technology toward an account of Energy Ethics is the seminal article by Mitcham and Smith (2013). Some scholars have proposed to focus on mid-level

principles and values, for example, by offering “a moral compass that can provide moral guidance for evaluating energy infrastructures, policies and choices” (Frigo 2018b). Others have suggested assessing the morality of controversial energy projects and improving decision-making through a multicultural applied ethics framework whereby different ethical theories are used as evaluative lenses (Bethem et al. 2020). In a similar vein, the Capabilities Approach (CA) has been applied especially to issues of energy poverty and access (Bartiaux et al. 2019; Frigo et al. 2021). Other efforts to develop a normative Energy Ethics are found in the area of Legal Ethics and Philosophy of Law. Although these are just some examples of the initial endeavors of normative Energy Ethics, the work of these and other intellectuals demonstrates how challenging and yet necessary it is to think about energy issues in normative moral terms. Given the current global challenges, this task is emerging as particularly helpful and crucial to the energy transitions debate.

#### Applied Energy Ethics: Philosophy of Engineering and the Ethics of Energy Technologies

Over the last few decades, the social and philosophical study of engineering and technology has seen three “*practice turns*” (Hillerbrand and Roeser 2016). The first practice turn singled out technology as a topic deserving of serious investigation as a social phenomenon. This turn relied on the methods of the social scientists who initiated it, and contributed significantly to the rise of STS. The second practice turn in Philosophy of Technology, often called the “empirical turn,” is often believed to begin with Kroes and Meijers (2000). These and following works steered the field away from broad, abstract reflections on technology as a general phenomenon toward the consideration of philosophical problems directly related to what technology is and what engineers actually do. Large parts of this research focus on ethical aspects in engineering design (Vermaas 2016) and also concentrate on specific energy technologies and energy systems, such as nuclear energy (Taebi and Roeser 2015). Currently, a third practice turn, which seems also rather engineering-oriented (van de Poel and Goldberg

2010), has been taking place in different ways and along various directions of research.

Another significant contribution to Energy Ethics comes from Responsible Research and Innovation (RRI), a framework that has become increasingly important as it has also been adopted within the EU Horizon 2020 Framework Program for Research. Using RRI in the context of energy systems illuminates the central role of (stakeholders) values in reasoning about energy technologies and projects (Correljé et al. 2015). A similar avenue of research is developed by scholars who have adopted the notion of “value sensitive design” (VSD) (Friedman et al. 2002), sometimes also known as design for values. Grounded in a theory of the design of technology that takes human values into account, VSD seeks to provide both theories and methods to systematically account for human values throughout the design process. Authors have focused, for example, on information systems (Friedman and Kahn 2006), communication technologies (van den Hoven 2007), and the design of interfaces between humans and computers, all of which relate to energy. These fields emphasize both empirical research on the values articulated in public discussions (e.g., the digitalization of the energy system, e.g., Milchram et al. 2018) and systematic frameworks for how to distinguish ethical values from mere preferences (Taebi 2017). Moreover, the sociotechnical nature of energy systems implies the necessity of envisioning institutional and technological design as intertwined (Künneke et al. 2015). As yet another way of addressing the sociotechnical nature of energy systems such as nuclear power or carbon capture and storage (CCS), some scholars have suggested that technological inventions should be considered “social experiments” (van de Poel 2011). A Rawlsian wide reflective equilibrium has been proposed for deliberation about values in public decision-making regarding (energy) technologies (Doorn and Taebi 2018). For a value-based approach, it is also important that values may change or evolve with time and with different stakeholders. This is particularly relevant for the energy sector as investments in this area are rather long-term and the impacts of path-dependencies

and locked-in energy technologies on future generations raise significant ethical dilemmas (e.g., greenhouse emissions or radioactive waste). Another key question concerns how to square ecological sustainability with other values such as privacy or bodily autonomy. The Capabilities Approach (CA) has been suggested as a possible framework for addressing such conflicts (Hillerbrand 2015) and to explore the relationship between different capabilities and changes in energy technologies (Hillerbrand and Goldammer 2018).

### Theology and Religious Studies

Interestingly, the first explicit appearance of the term “energy ethics” in English-written scholarship was Hessel’s book *Energy Ethics: A Christian Response* (1979), which still stands as an exemplary contribution of religious thinking to the topic of energy. More recently, Biviano has advocated for a type of Energy Ethics that pays “attention to current energy realities with scientific and technological precision, and can offer unique clarity about the specifically moral character of the problem” (Biviano 2018). Of course, a major example of Catholic engagement with environmental and energy issues came in 2014 with the publication of Pope Francis’ encyclical *Laudato Si’* (Francis 2015) as part of a series of related activities and events organized by the Vatican. The encyclical constitutes both a call for action and an eco-theological vision. It explicitly and repeatedly mentions the term energy in connection with its efficiency, conservation, equal distribution and access, and advocate for moving toward nonpolluting forms (e.g., § 26). Following *Laudato Si’*, the book *Energy, Justice, and Peace: A Reflection on Energy in the Current Context of Development and Environmental Protection* (Pontifical Council for Justice and Peace 2016) further clarifies the links between the topic of energy and issues of justice and peace from a Catholic perspective. Outside of the Christian tradition, for example, Elahee has offered an Islamic perspective on energy management, sustainability, and development (Elahee 2014). Although other religious traditions have also been exhibiting growing concern for environmental

and energy issues, scholarly material that is both published in English and explicitly refers to energy and ethics has been to date difficult to retrieve.

## Energy Justice

Three recent journal special issues about Energy Justice attest to the scholarly relevance of this emergent field (*Energy Research & Social Science* Vol. 18, 2016; *Energy Policy* Vol. 105, 2017; *Journal of Human Development and Capabilities*, Vol. 22, 2021). Energy Justice has initially flourished especially in the United Kingdom and Europe, where several scholars have proposed and established frameworks for the field, clarifying its orientation and spreading its adoption. Recently, there have been attempts to expand both the theoretical and geographical scope of Energy Justice scholarship (Bombaerts et al. 2020). Although Energy Justice has been flourishing across various disciplines (Heffron and McCauley 2017), two primary and interconnected ways of envisioning it have been proposed thus far: the so-called “triumvirate of tenets” and the “principled approach” (see Wood and Roelich 2020). Both approaches are especially focused on the relationships among energy issues and the pivotal aspects of injustices, vulnerability, and poverty.

The particularities of the first approach can be appreciated from recent articles that further expand the theoretical foundations of Energy Justice (Jenkins et al. 2016). Drawing on the seminal work of McCauley et al. (2013), Jenkins et al. formulate a definition of Energy Justice as the tool that “evaluates (a) where injustices emerge, (b) which affected sections of society are ignored, (c) which processes exist for their remediation in order to (i) reveal, and (ii) reduce such injustices” (175). They then present the three types of justice that constitute the so-called “triumvirate of tenets” (originally by McCauley et al. 2013): distributional, procedural, and recognition-based justices. *Distributional* justice investigates the cases in which energy production and consumption raise justice concerns. *Recognition-based* justice

“moves researchers to consider which sections of society are ignored or misrepresented” and highlights cases of nonrecognition and disrespect with regard to, for instance, indigenous peoples (de Onís 2018), the elderly, people with a disability or underlying medical issues (Snell et al. 2015), or those who are particularly vulnerable due to spatial inequalities (Bouzarovski and Simcock 2017). Finally, *procedural* justice assesses the ways in which decision-makers have sought to engage with communities, suggesting mechanisms for better inclusion of affected stakeholders within energy projects. Jenkins has argued that Energy Justice is different from both Environmental and Climate Justice (Jenkins 2018). Highlighting its originality, she suggests that the main differences lie in its non-antiestablishment, or non-activist past, its methodological strengths, and its interests in being policy-relevant.

The “principled approach” can be exemplified by Sovacool’s book *Energy & Ethics* (2013). In it, the author stresses the relationships between access to energy and resources, technologies, policies, and the moral issue of justice. Several ethical principles are discussed therein, such as availability, affordability, due process, transparency and accountability, sustainability, intra-generational equity, intergenerational equity, and responsibility. These principles are proposed as a framework for understanding and assessing the justice dimension of energy issues and are also meant to provide moral guidance in decision-making. The reflections presented in this entry are further developed in an article devoted to a comprehensive and comparative account of Energy Justice studies (Sovacool and Dworkin 2015). The article proposes that these and other ethical notions may be useful to broaden and strengthen the “triumvirate of tenets” framework.

## **Energy Ethics, Justice, and SDG7**

Sustainable Development Goal 7, proposed by the United Nations as part of the SDG Compass, represents a bold attempt to address issues of energy poverty, access, and (in)justice (UNDP 2018). Pursuing this goal can be considered also

a way to bring ethical and justice considerations into the energy transitions debate. SDG7 seeks to “ensure the access to affordable, reliable, sustainable and modern energy for all” to “promote broader energy access and increased use of renewable energy, including through enhanced international cooperation and expanded infrastructure and technology for clean energy.” The assumption is that “a well-established energy system supports all sectors from medicine and education to agriculture, infrastructure, communications and high-technology” (UN 2016). Many scholars have showed that an increase not just in the availability, but in the actual access to modern energy services is directly linked to many dimensions of human development, a point that is important worldwide but is especially crucial for so-called developing countries and primarily in the Global South.

This entry has briefly addressed two recent developments across the social sciences and humanities: Energy Ethics and Energy Justice. The first area encompasses descriptive and normative approaches, which were discussed through several examples of past and current scholarship. The second field was discussed in terms of its two primary orientations to date and, overall, emerges as more policy-oriented. Another potential way to frame these emerging fields is to consider Energy Justice as one of the key components of a normative type of Energy Ethics. In this sense, the latter would correspond to a broader area of inquiry while the former to a more applied, policy-oriented theoretical framework. Overall, the intellectual endeavors discussed above contribute to raising awareness of the fact that ethical assumptions, concepts, analyses, and reasoning are not ancillary to the sociotechnical energy transitions debates. Energy Ethics and Energy Justice are valuable approaches for exploring alternative ways of thinking about the human relationship to energy and the natural environment. In particular, inquiries in these field can fruitfully contribute to spell out the requirement for actually achieving just, ethical, and sustainable energy transitions, which are all key elements toward achieving SDG7 in practice.



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