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Powering Justice: Sketches for a New Ethos in Energy Policy

Erin Rizzato Devlin
University of Glasgow, Scotland

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Cover Page Footnote

I would like to thank all those who have been around me during the process of discovering, imagining and writing this work. Firstly, I am grateful for the endless and undying support of my mother and father, for bringing me into this world and unknowingly showing me the value of ethics through their example. I am grateful for all the women around me for their source of love and inventiveness: my grandmothers, Isobel and Adele, my sister Emir, my dear friends Sofia and MaryAnn. I would also like to thank my supervisor for his acuity and guidance; my brother Sean; and all those who have taken the time to read through these words and shine light upon them with their brilliant thoughts. Finally, I'd like to thank Vilhelm for bringing me strength and solace day by day throughout this journey. For each one of you, I write this and always struggle for the welfare of our planet.

POWERING JUSTICE:
SKETCHES FOR A NEW ETHOS IN ENERGY POLICY

Abstract

Energy politics lie at the heart of human activity. In a time of ecological and energy crises, it is fundamental to realise that our reality systems are always open to change and that, in order to respond to the challenges of a changing energy landscape, we must explore the full possibilities of technology in a radical way. This analysis aims to consider the ethical implications of energy and technology, presenting an urgent case for cosmotechnical pluralism, that is the diversification of world-views, knowledges, technologies in the realm of global politics. To reconstruct the world and its politics around the existence of several ways of navigating and conceiving it, literally leads to a change in reality. The notion of cosmotechnics will present a way of conceiving of the cosmic, epistemic and technic order as interconnected: in this spirit, this exploration will travel through the prisms of cosmology, epistemology, morality, to subsequently enter into the room where energy policies are created. By employing this tripartite framework, policy directions will be suggested on the path towards energy justice in the hope of shining some light on what moral practices of policy-making in the field of energy politics could look like.

PROLOGUE

Energy rests at the core of human life on earth: it weaves through every single activity, through every inhabited place, from the most basic daily task to the waging of war and international agreements. Today, the challenges of global politics require us to fuel change and adapt to a changing energy landscape. This article considers the ethical implications of energy and technology, along with their political significance in the renewable transition. It is not a call for political ‘‘multiculturalism’’, or an argument for specific policies to be standardised: it rather wishes to make a case for planetary thinking in a world where globalisation has taken root. It is a reminder for global politics that our reality systems are made up of contingent metaphysical assumptions and, as such, these are always open and ready to be changed. It is a call for diversity, in order to fully open the possibilities of technology in a radical way. Modernisation, with its peculiar metaphysics, has recognised these differences yet made them contingent. In a world that has surpassed the language of unilateral globalisation and is now facing an environmental crisis, we are more and more pushed to think as a planet: this ancient project, however, has steered us towards a world-civilisation manoeuvred by Western Europe[1] and its offspring.

It is within this reality that we write and consider the morality of technology, in particular energy technologies, in the political sphere. Energy politics lie at the heart of human activity and present a field which is global but yet to be conceived in a manner that departs from western-centric, liberal and post-enlightenment assumptions (Galvin). Energy issues will thus be framed as ‘‘wicked problems’’ that require a fundamental extension of morality, rather than a merely technical

[1] All mentions of ‘‘western’’ culture hereon refer to those nation-states on the European, North American, Oceanic continents which have most contributed and profited from environmental catastrophe (see Malm).

solution, in the hope of shining some light on what a moral practice of policy-making in the field of energy politics could look like. This exploration will be undertaken in three chapters, with the first part examining theoretical premises in relation to world-visions, knowledges and technologies. This will be followed by an interlude on ethics and energy, to highlight their interconnections and the focus of our concern, finishing with a third chapter on alternative ways of conceiving energy issues and suggesting policy directions to address them.

In the words of Yuk Hui, ‘‘diversification is the imperative for a planetary thinking to come, and this in turn demands a return to the earth’’. The earth is, in fact, the very place where energy politics depart: this claim summarises the profound interdependence between environmental and energy ethics that pervades the entirety of this work. For this reason, the diversification of knowledges, technologies and politics should be grounded in the importance of locality, to both preserve and innovate in the service of locality itself. A planetary world departs from the local.

Figure 1: *Tabula Rogeriana*. Map by Muhammad al-Idrisi, 1154.

To reconstruct the world and its politics around the existence of several ways of navigating and conceiving the world, literally leads to a change in reality. Just as the *Tabula Rogeriana,* which for three centuries was the most precise planisphere, representing north at the bottom and south at the top, this work can be read as an invitation to flip one's perspective. In doing so, we reframe what it is possible to do, think, imagine within reality. By changing our own perspective within it, we can change the world itself. The presence of different perspectives and multiple cosmologies must compose the fabric of a politics of the future.

PART I: THEORY

The restless succession of ecological crises and technological disasters in the last decades has led us to a point in history where the implications of human-induced climate change may shape the course of societal evolution for millennia. This moment represents nothing less than the culmination of two centuries of fossil fuel-based industrialisation and it urgently requires that the relationship between energy, humanity and technology be reconsidered and reinvented in order to move away from a fossil fuel mentality. As the IPCC Summary for Policymakers states, it is unequivocal that human influence has warmed the atmosphere, ocean and land. Planetary thinking can strengthen political practices that are able to withstand the necessity of fossil fuel-powered growth and extractive industries in the pursuit of economic activities, thus transitioning towards ethical and sustainable energy economies. Herein, these will be proposed and explored through theory, ethics and practice.

The theoretical architecture of this article will be founded on three pillars drawn from Yuk Hui's definition of ''cosmotechnics'', delineating in such way the cosmic, moral and technic order. These involve world (in Ancient Greek, κόσμος), knowledge (ἐπιστήμη) and technology (τέχνη). The first section will begin by appealing to the idea that our conceptions of the cosmos are multiple and have an impact on the ethico-political possibilities that unfold within it. Secondly we will consider how the universalisation of one particular epistemology, that of the Western world, has been elevated to a global metaphysics above all others (Hui): in order to open up our possibilities in the global political space, the diversity of knowledges must be equally preserved, as politics evolves in the interaction of diverse but equal citizens (Arendt). Thirdly, technology will be considered as an expression of the cosmo-visions within which it is embedded: following the important lesson of Donna Haraway, in fact, technology is not neutral. The question regarding technology emerges as an essential step in the path towards energy justice and a planetary politics of the future.

The fact that energy constitutes ''the missing link in globalisation'' (Overland), requires further study of its role at the crux of political, environmental, cultural and technological concerns. For this reason, an urgent case for technodiversity will be presented below, travelling through the prisms of cosmology, epistemology, morality, to subsequently enter into the room where energy policies are created.

COSMOS

Mais il ne suffit pas de crier 'Vive le multiple!'; le multiple, il faut le faire.[2]

Henri Bergson, in a letter to Deleuze, 1987

Yuk Hui defines cosmotechnics as the unification of the moral and cosmic order through technical activities. This definition delineates the immanent connection between technics in their cultures of generation and use, a moral conception of the cosmos, and the impossibility of thinking about global politics without referring to the role of technology. The connection between technics and the cosmos is mediated by morality, which requires special consideration particularly in relation to energy: whilst often reduced to technical issues and matters of cost, energy decisions involve moral and political choices about the kind of world we want to live in (Van de Graaf and Sovacool). Energy is not simply a commodity, but a key driver of world politics and social change: just as technology, it is made up of tools, processes, products that can promote ''authoritarianism as well as liberty, scarcity as well as the abolition of toil'' (Marcuse, 415). For this reason, technics and energy policy must be married to profound moral and philosophical considerations in order to guide their practice towards a sustainable, planetary future.

For the ancient Greeks, the term ''cosmos'' referred to an ordered world, yet also extended to something beyond the earth itself: that is, the moral order (Hui). Through the comparison of the Greek conception of the cosmos with the Chinese, Irish or Amazonian, it becomes clear that different understandings of what the cosmos is, are reflected in different ways of conceiving morality and interacting with the world. Cosmologies are ''schemas that define modes of

[2] ''*But it's not enough to shout 'Vive the multiple!'; the multiple has to be done*.'' (Deleuze and Parnet).

participation, but also correspond to the moral grounds of such participation'' (Hui, 3). In *Technic and Magic*, the philosopher Federico Campagna proposes this principle to make sense of cosmologies: reality systems are merely contingent conglomerates of metaphysical axioms, the modification of which is always open and possible. In other words, how we view reality has a profound impact on the ethical and political actions and limitations that exist within it. To borrow from Heidegger, the way in which humans order their cosmos is ''a way of revealing, of bringing forth'', thus of shaping one's reality. It is from this hopeful premise, that this investigation departs: we are always capable of changing our view of the world in order to create ethico-political alternatives. Therefore, thinking of global politics in terms of cosmologies and epistemologies may shine light upon new ways of envisioning and utilising technologies.

Planetary thinking is first and foremost an imperative for addressing diversities: biodiversity, noodiversity, technodiversity (Hui). Herein the diversity of human life, that is cultural diversity, will be addressed. When speaking of cosmologies, the legitimacy of the Western cosmo-vision is accompanied by a dismissal of ''the agencies of earth and the plural worlds it fosters'', hence ignoring ''cosmo-visions that embrace the agency of earth and other beings'' (Fishel *et al*., 216). Particularly in an interconnected world, where the West has historically spurred a fossil economy, elected as a ''cosmopolitics'' above all others, it is essential to depose this from its position of pre-eminence. When dealing with global environmental politics, in fact, the dominant neoliberal approach has imposed a ''Western secular worldview on a planetary phenomenon'' (Burke *et al.*, 517). In order to create political solutions that are inclusive and planetary, the illusion of a single dominant ontology must be dismantled and replaced by the recognition of multiple world-visions.

The ‘‘ontological turn’’ is a movement that identifies and addresses this crisis of modernity and ecological disequilibrium that pervade our world. As Eduardo Viveiros de Castro claims, we are living within the context of a Great Divide, as a ‘‘gesture of exclusion that made the human species the biological analogue of the anthropological West, confusing all the other species and peoples in a common, privative alterity’’ (44). In *Cannibal Metaphysics*, he proposes the notion of a multiplicity of natures (‘‘multinaturalism’’) underlying the Amazonian cosmology, to oppose the ontological monism and homogenous nature (‘‘multiculturalism’’) of the Western cosmology. Whilst the former subscribes to a cosmopolitics, thus embracing a perspectivist multiplicity intrinsic to the real, the latter is founded on the Cartesian dualism between nature and technology, where the cosmos is transformed into a standing reserve for exploitation by chosen humans. In this sense, what is revealed by the latter is ‘‘a challenging-forth [*Herausfordern*] which puts to nature the unreasonable demand that it supply energy which can be extracted and stored as such’’ (Heidegger, 14). The role of technology, as intended by the Western cosmology, is therefore something that must control and exploit nature for its own fulfilment.

In Yuk Hui’s words, ‘‘the ontological turn in anthropology is a call for a politics of ontology’’ (7). In fact, if reality is historically, culturally and materially located, then this cannot be conceived as merely plural, thus viewed from diverse perspectives that relate to ‘‘a monopolistic vision of truth’’: reality must rather be multiple, as it is not only observed but created, performed, enacted (Mol). In fact, we live in a world that, rather than simply being composed of multiple *aspects* of reality, presents multiple *versions* of it. This is what the Zapatistas call ‘‘a world in which many worlds fit’’.

In line with Viveiros de Castro's multinaturalism, the reconciliation between the cosmic and the moral order is enacted through different instruments, different technologies. Following this, ''technology is not an anthropological universal, but rather is enabled and constrained by particular cosmologies; thus there is no single technology, but rather multiple cosmotechnics'' (Hui). The key is diversification, which must be founded upon the consideration of locality as an essential parameter not only to preserve, but also to innovate in service of change. If it is true that ''technology is a way of revealing; it reveals whatever does not bring itself forth and does not yet lie here before us'' (Heidegger, 12), then a global energy politics of the future must be concerned with what its technologies are bringing forth. It is thus essential to extend and deepen the ethical and environmental outlook of policy making in a (Western) world where ''the earth reveals itself as a coal mining district, the soil as a mineral deposit'' (Heidegger, 14).

By opening up an anti-universalist and ontologically pluralist perspective of technology within and beyond the West, it becomes possible to recognise the existence of non-Western realities where technology is connected to the cosmos. Cosmopolitics is ''a politics attuned to the biological, geological and cosmological forces of the universe, [...] rooted in the acknowledgement of the multiple, diverse and constantly transforming beings that constitute the cosmos'' (Mitchell). In this sense, the global cannot be situated (Conway). By rethinking and accepting cosmotechnical pluralism, or technodiversity, in the realm of politics, the question concerning technology becomes a matter of moral concern and a potential force towards an inclusive and planetary politics. This, I believe, is what Yuk Hui intends when he puts forth the proposal of ''cosmotechnics as cosmopolitics''.

EPISTEME

> *Is the knowledge we produce able to add reality to, rather than to subtract reality from, the urgency to think and feel, with our own means, the mute urgency whose name is Gaia, to think and feel with the thousand names of Gaia?*
>
> Isabelle Stengers, 2015

When he presents his notions of diversity, Yuk Hui speaks of ‘‘noodiversity’’, with reference to ways of reasoning. From a technological standpoint, this currently involves the ‘‘universalisation of a set of particular worldviews and epistemologies’’. The productivist metaphysics of modernisation, he continues, have rendered diversity contingent. In his later works, Michel Foucault similarly denominates systems of knowledge as ‘‘epistemes’’ and defines them not only as ways of life, but as ways of thinking and feeling, as ‘‘sensibilities’’. Each of these is inevitably interweaved with different localities and times, yet this is transforming due to the synchronisation and uniformity of technological development, also referred to as ‘‘Westernisation’’ (Hui). Epistemological diversity, that is, ‘‘the diversity of knowledge systems underlying the practices of different social groups across the globe’’ (de Sousa Santos *et al*., 20), is essential as it grounds other kinds of diversity. For this reason, we now turn to knowledge systems in order to recontextualise and reimagine Western epistemology (and science) within a much vaster landscape

of epistemological and political possibilities, on the path towards an ethics of knowledge: by broadening the ways of seeing our cosmos, or engaging with epistemes, our technological possibilities are broadened too. As we will see in the forthcoming chapters, the contribution that a plurality of epistemologies (be it of women, rural communities, indigenous people or others) can offer in the context of energy decisions is fundamental. It is of utmost importance to put into question what sorts of epistemologies are called forth and which ones are quietened in the pursuit of decision-making. The struggle for epistemic justice is one essential step on the path towards energy justice.

In spite of being hegemonic, universalised and globalised, modern science is ‘‘but one form of organising knowledge, assessing information about reality, and devising tools to intervene in it’’ (Westhelle, 383). The epistemological privilege that has been historically granted to modern science, founded on the scientific method and Cartesian dualism, however allowed for the West to undergo technological revolutions and consolidate its hegemony over other forms of knowledges (Santos *et al*.). This suppression of the knowledges of other realities, of other worlds on behalf of Western forces, as claimed by sociologist Boaventura de Sousa Santos, constitutes ‘‘epistemicide’’ and represents the epistemological foundation of the order that the West has exported across the globe. Reason, in this context, ‘‘becomes equivalent to an activity which perpetuates this world’’ (Marcuse, 415). This is relevant to this exploration as the suppression of other knowledges, on behalf of the West, presents the latter’s epistemic and technological solutions as the only ‘‘reasonable’’, ‘‘realistic’’ option, thus invalidating alternative ways of dealing with technological challenges. However, it is important to remember that ‘‘science can be said to be a ‘local’ knowledge, however expanded this locale and bright the field it enlightens’’ (Westhelle, 384). In

light of this, the contribution of other worlds should ‘‘neither elevate nor relegate the world that derives its ontology from the obligations of naturalistic scientific knowledge’’ (Conway, 172). In a world where noodiversity is cultivated, the ‘‘monoculture of scientific knowledge’’ must not be eradicated, but rather become part of an ‘‘ecology of knowledges’’ (Santos *et al.*), in order to benefit from the full range of localised human knowledge essential for informing a global context grappling with climate and ecological crises. In fact each world is one amongst others, yet like no other.

In his work *Epistemologies of the South*, de Sousa Santos writes that to distance ourselves from hegemonic Western thinking is to fundamentally fulfil an important theoretical task, ‘‘that the unthinkable be thought, that the unexpected be assumed as an integral part of the theoretical work’’ (38). In his view, this is done when the epistemologies of the global South are counterposed with the dominant epistemologies of the global North, thus opening analytical spaces for realities that appear novel due to being previously ignored, rendered invisible or even near eradicated. By reducing the world, in fact, we also lose much of it: this is what Heidegger refers to when he writes of the ‘‘forgetfulness of Being[3]’’ (*Seinsverlassenheit*) or the false belief that the entire world is there to be grasped (Björk), thus implying that we must learn to approach the world with awareness of an element of mystery, of the ‘‘unknown’’ (Hui). Therefore knowing is not about predicting, but rather being ‘‘attentive to the unknown knocking at our door’’ (Deleuze). It is for this reason that we must remain open to the full possibilities of any global political project and imagine alternative ways of seeing, knowing, doing, rather than merely resorting to standard practices and embedded norms.

[3] Being, in Heidegger’s philosophy, partially intended as ‘‘the possibility of some interpretation and determination of both human and non-human beings, thus of a world’’ (Bartky).

If it is true that politics and ethics ground struggles for what may count as rational knowledge (Haraway), then in order to address this epistemological question we should rather focus on ‘‘the very examination of the moral foundations on which our epistemologies work’’ (Westhelle, 387). Through an ethics of knowledge, the diversification of life forms, epistemologies and practices can be achieved and provide an important contribution to matters of global politics. To conclude, we need a new diplomacy: ‘‘an epistemological diplomacy grounded in the project of technodiversity’’ (Hui).

TECHNE

> *Se questa scienza che grandi vantaggi porterà all'uomo, non servirà all'uomo per comprendere se stesso, finirà per rigirarsi contro l'uomo.*[4]
>
> Giordano Bruno, 1584

During most of human existence, people gathered water, chopped wood, lit fires or used the sunlight: this was all that energy would mount to. From the industrial revolution onwards however, energy became much more complex as one of the most important forces of globalisation: coal, oil, electricity, natural gas and nuclear fuel amongst other sources travelled across borders, creating

[4] *‘‘If this science that brings great advantages to mankind, will not serve man to know himself better, it will act against him’’* (Bruno).

new interactions and dependencies across the globe. As Yatchew formulated, ‘‘the pursuit of energy is a fundamental driver of human history’’ (74). However, one should oppose the notion that globalisation, that is the homogenising process that is spreading one cosmo-vision as the world is becoming more interconnected, is ‘‘inexorable, unidirectional, technologically determined’’ (Overland) and rather reimagine it as an open and technologically diversified process.

According to a recent report by the International Energy Agency (IEA), ‘‘technology will largely determine our energy future’’. As in the industrial revolution, the initiating green energy transition and the digital revolution have contributed to enhancing the means and scope by which we use resources, and consequently the connection between (modern) technology and energy has become more tightly coupled and indissoluble. For this reason, discussing some background considerations regarding technology is essential in the pursuit of contemporary energy policy. In Plato’s view, in fact, ‘‘*techne* serves as a model for politics and not the other way around’’ (Winner, 40). In line with this, technology should not be interpreted as a monolithic phenomenon, but rather as incarnated objects that profoundly shape and affect the human experience, as well as socio-political structures. To reopen the question on technology is, in fact, to refuse the presupposition of a homogeneous technological future that appears to be the only option we are faced with (Hui). A conception of technology that is diversified and localised can, in the Platonic spirit, contribute to the amelioration of energy policy on a global scale.

This exploration owes much to the phenomenological thought of Martin Heidegger, yet recognises the potential limitations of his philosophy when applied to technological development outwith the West and in the context of a global ecological crisis. Nonetheless, his important essay *The Question Concerning Technology* still presents a precious contribution for the purpose of considering

technodiversity, particularly when married with the recognition of the diverse technical relationships that entwine with the cosmos. As, in his words, ‘‘technology [*Technik*] and history [*Historie*] are *the same thing”* (Heidegger, 38), instead of proposing a universal history of one single technology and its development throughout time, the history of technology can be reconceived as a recount of several cosmotechnics. The triumph of Western metaphysics has however set the stage for a hegemonic and homogenous notion of technology that appears to be at the forefront of our current politics.

The success of eighteenth-century political economy, as presented by David Harvey, was its ability to mobilise the human imaginary of emancipation and progress into forms of discourse that could ‘‘alter the application of political power and the construction of institutions in ways that were consistent with the growing prevalence of the material practices of market exchange’’, whilst concealing social relations and ‘‘subsuming the cosmic question of the relation to nature into a technical discourse concerning the proper allocation of scarce resources for the benefit of human welfare’’ (131). Historically, in fact, the fossil fuel economy bears greatest responsibility for the production, dissemination and employment of energy and technology, thus becoming the hard core of the environmental catastrophe we finds ourselves in the midst of. In *Fossil Capital*, the political ecologist Andreas Malm defines ‘‘the fossil economy’’ as an economy of self-sustaining growth founded on the use of fossil fuels therefore creating a concomitant growth in carbon dioxide emissions. This has ‘‘the character of a totality, […] a socio-ecological structure in which a certain economic process and a certain form of energy are welded together’’ (Malm, 12). Particularly in the realm of energy ethics and policy, technology acts a force capable of opening up new ethico-political possibilities, or by contrast limiting these to one single model of development. In fact, ‘‘power in the twenty-first century lies not in the parliament but in infrastructure’’ (Hui).

Infrastructure in this sense must be understood not merely as a materialistic concept, but entangled with a series of axiological, epistemological and ontological assumptions. Technology is precisely this: the expression of the cosmic and moral orders' encounter, profoundly enmeshed with their epistemological premises. And as the Frankfurt School philosopher Herbert Marcuse writes, ''technological power tends to the concentration of economic power […] [and] affects the entire rationality of those whom it serves'' (141). Thus it becomes a circular movement, where ownership of technological supremacy leads to its reinforcement through ''industrial empires owning and controlling materials, equipment, and processes from the extraction of raw materials to the distribution of finished products'' (Marcuse, 141). It is therefore essential to realise that technology is not neutral (Haraway). Rather, it has the power to both liberate and constrain human lives, legitimise or delegitimise their epistemology, include or exclude their worlds. For this reason, it is essential that political practices in this field be accompanied by the consciousness that there is a reality of plurality (of world views, knowledges and technologies) which should be fostered, and not flattened, through ethical consideration.

To conclude, it is only through the recognition of technodiversity that new paradigms, new cosmotechnics can emerge. Cosmotechnics ought not to be defined as many cultures or contexts employing the same technologies with minimal variations, but rather as the existence of different technics altogether which are declined according to different cosmologies, epistemologies and views of the worlds. There can be no energy justice without technological justice (PEOTP). A technic bent by its contingent, local geographies is the logic towards a responsible planetary future.

PART II: ETHICS

As one of the most basic scientific concepts, energy has been defined as the ability to do work, thus exerting a force over a distance and, in line with the second law of thermodynamics, representing an opportunity for change (Hazen). The importance of such definition within this context presents energy as something that takes different forms, subject to variations. Energy runs both above and beneath the earth in petrolic, hydraulic, electrical, psychic, sexual forms amongst others (Hui): this is required for every activity and each interaction, every object and each landscape we engage with. In this way, justice relating to global energy is inextricably weaved into social and environmental justice. Energy is, indeed, an essential thread in the tapestry of life (Pasqualetti). The recent work on energy ethnography (Smith and High) and energy ethics (Sovacool *et al*.) demonstrates that energy intimately affects societies and involves deeply ethical judgments about what sorts of lives we desire for ourselves and others. It is essential to remember that ‘‘energy is a social issue with a technical component, not the other way around’’ (Pasqualetti). The surge of such considerations in energy politics literature provides hope that a more critical and moral approach is on its way.

The primary aims of this chapter will be to introduce the peculiar nature of energy to this framework and to illustrate the connections between energy and ethics, by emphasising that energy concerns are most clearly understood when investigated through an ethical lens. This is done by choosing not to rely on a single, dominant framework, in order to carry forward the lessons of the previous chapter and imagine ways of conceiving new and better values to open up the possibilities of our energy future. This ethical interlude will provide the necessary tools to set the scene for

more practical considerations on policy in the final chapter, where the theoretical framework above described will be explored in practice to respond to the need for an ‘‘institutionalisation of ontologies’’ (Hui), ecological awareness and profound political renewal.

FROM ONTOLOGY TO POLITICS

According to the United Nations, the seventh development goal prefigures to ‘‘ensure affordable, reliable, sustainable and modern energy for all’’. However, their 2022 Report declares that the current pace of progress makes it impossible to achieve this goal by 2030: ‘‘achieving energy and climate goals will require continued policy support and a massive mobilisation of public and private capital for clean and renewable energy, especially in developing countries’’ (UN). Although justice in relation to the supply, consumption and end-use of energy is receiving more attention in global policy, their connections to deeper ethical concerns and normative judgements concerning people, environment and technology, as well as moral responsibility towards other countries, entities or generations, are not (Melin *et al*.).

Nonetheless, it is necessary to remember that every single stage of the energy system relates and interacts with people: for this reason, energy justice must be underpinned by a profoundly ethical commitment to the value of the other, no matter how distant their homeland, culture or values. The highly unequal energy consumption rates, according to which the US consume ten times more energy than India or Nigeria, states otherwise. In fact, according to an often-cited calculation, in order for everyone to live as an American we would require five Earths: this means that the US ‘‘owes the rest of the world at least four worlds [...], that there are too few people with too much

world, and too many people with way too little'' (Viveiros de Castro and Danowski, 186). The issue here is not that each should have equal access to disproportionately energy-intensive ways of living, but rather that global policy must recognise that different cosmologies, cultures, communities and non-human beings should be given proportional space and the energy needed to lead a good life.

The interconnections between energy consumption and climate change are evident: glaciers are melting, weather patterns are becoming more frequently extreme, migrations are shifting in all continents. Some populations are more vulnerable to climate variability than others, and these tend to be located in nation-states that are least developed and have the lowest rates of carbon dioxide emissions (Sovacool and Dworkin). According to a global study on emissions accountability, people in rich countries who are historically accountable for most GHG emissions, impose 200-300 times more health damage onto other counties than they experience themselves (Smith *et al*.). Climate change is indeed ''the most regressive tax in the world: the poorest pay for the actions of the rich'' (Smith). Along with these intragenerational issues, climate change presents profound intergenerational costs, involving respect for future generations. As ''nothing comes without its world'' (Haraway), an ethic of energy must depart from its natural costs to the environment, particularly in a time of ecological crisis. Energy justice, in fact, has its roots in environmental ethics (Sovacool *et al*.): for this reason, we explore this connection to make sense of how an ethic of environmental awareness can inform a holistic practice of sustainable, and not merely ''green-tinted'' energy on a global scale.

As climate change has a locally and contextually specific nature, community-based adaptations and indigenous knowledges are essential on the path towards resilience (Ayers and Forsyth). These

may involve traditional ways of interacting with one's environment, such as the practice of harvesting the moisture from fog as an unconventional water source in Chile, Morocco and South Africa (Farnum) or the six-thousand-years-old floating island technology of the Ma'dan in the wetlands of Southern Iraq (Watson), amongst a multitude of others. Additionally, resilience may involve adapting to a changing environment through alternative solutions that best suit contextual conditions such as the construction of railway lines with incorporated cooling systems to minimise permafrost in Tibet or the drainage of glacial lakes in Bhutan (Sovacool and Dworkin).

The importance of locality, however, is not here raised as a case against globalisation *per se*, where the two stand in an irreducible dichotomy, but rather as a way to question what kinds of interrelations are needed to construct an alternative approach to planetary processes altogether, in service of these localised needs. Local place is where the heterogeneity (of ontologies, of epistemologies) is produced, but also where the global is constituted and created: the issue does not lie between the local/global distinction, but rather in the fact that some (Western) localities have more purchase on the levers of globalisation than others (Massey). Although most struggles against this unequal power, of course, are local, the question of how we can politically surpass a single struggle can only be achieved by imagining an accumulation of localisms (Massey). In line with deep ecologist thought, an impetus towards localisation in the form of local autonomy and decentralisation could not only reduce pollution problems, but also energy consumption (Naess). Also politically, interposing subnational and international institutions, federations or coalitions between the local and the global realities of energy may make communication between the two less efficient and transparent. The power of the global is precisely that it differs from place to place, whilst building solidarity, support and cooperation amongst diversity.

A NEW ENERGY ETHOS

The maintenance of unjust structures, committed to the exploitation of energy and people across the globe, is contradictory to the conditions that foster the existence of many forms of life (Setreng). A new energy ethos ought to be one that presupposes ‘‘deep experience, deep questioning, deep commitment’’ (Naess). Energy technologies more explicitly, but also energy policies, strategies and solutions should never be considered value-free: these are always connected to agents, ideas and political arrangements. Even when these are directed towards ‘‘greener’’, ‘‘cleaner’’ futures, they do not automatically create better circumstances for all, but nonetheless require deep ethical questioning. That is why, as Bell *et al.* argue, adding women and solar panels to energy practices is not enough: merely formal adjustments and new fuel technologies alone cannot solve the global issues with which we are faced, without a new fuel politics. These lacunae can be more adequately addressed through a framework constructed around cosmologies, epistemologies and technologies, where the interconnections between these disparate yet related issues call for a more fundamental transformation in political practices. Mere growth in renewables, in fact, does not directly displace the use of fossil fuels, but in many instances contributes to the growth of total energy production. What is needed is a more radical moral transition to accompany and enlighten the renewable transition, in recognition that there are different ways of extracting, using, engaging and becoming with energy.

As Geerts *et al*. claim, the task of policy-makers within this context is not necessarily to fit renewables into current energy systems, but more importantly to conceive of a system that is both sustainable and fulfils human needs. In fact, focusing on the production of energy to accommodate renewable sources, whilst forgetting to address other aspects of the transition such as consumption or waste disposal, proves to be a misconception of the problem. Moving towards a sustainable energy transition is thus not merely a change in energy inputs, but a change in values, ethos, policies and politics. In fact, a different type of energy supply, perhaps more in tune with the daily or seasonal progressions, will naturally induce changes in practice and consumption as well.

This is what is meant in the distinction between potentiality and flux. Whilst our current system is grounded in an understanding of energy as potentiality, thus as something that in the Heideggerian sense is simply ‘‘standing in reserve’’ and waiting to be put to use at the touch of a switch, energy can also be understood as flux. Here the degree of human control is reduced, as this form of energy cannot be extracted or stored due to its flowing and elusive nature. This can take the form of a windmill or a solar panel, where the temporal fluctuations in the energy source (wind, sunlight, tide) determine its function, thus leading to reduced consumption or rhythms that resemble the passing of the day (Geerts *et al*.). At the moment however, when it comes to green electricity there is no guarantee that the electricity being used is in fact generated in a renewable way, as the utility company still produces it through a combination of sources to compensate for temporary unavailability from renewable sources. This demonstrates that although electricity in the network is in flux, it is still treated as potentiality, measured as a mere substitute for the quantity of fossil fuels needed to create it: the change that is required is thus not merely technological, but most importantly moral, behavioural, social, thus recognising different means and ways of interacting

with the world. New forms of renewable energy, although often reducing convenience for some (see Geerts), have the potential to connect people to their environment and deepen their understanding of how energy interacts with values, places and people. In order to fulfil the UN's seventh development goal and promote affordable, reliable and sustainable energy for all, the ethical values of energy decision-making must be renewed in light of their social and environmental consequences.

When advocating for a politics of ontologies, Hui claims that at the center of such politics there must lie a ''recognition of a plurality of ontologies in which natures play different roles in everyday life'' (7). This recognition, however, is only the first step: politics arise precisely when these ontologies encounter and interact with each other. The question regarding technology exposes the fact that the contributions of certain ontologies can be made possible only on condition that they are already adhering to a particular cosmotechnics: this means that only by adhering to the hegemonic Western technologies, other marginalised ontologies may be considered. For this reason, in the coming considerations around specific energy policies, it will be essential to carefully reconsider notions such as ''indigenous ontology'', or ''traditional knowledge'', as these have been profoundly changed and estranged by the domination of modern technologies. Cosmotechnical thinking can contribute to the institutionalisation of different ontologies, epistemologies, technologies by moving beyond the Western tradition and a globalisation dictated by the discourse of mere economy. When politics is rather conceived as a way of ''making kin'' between humans, cultures and species (Haraway), then relationality and (inter)dependence becomes a basis for ethical reasoning underlying the ways in which we interact with energy systems in transition on a daily basis. Whilst the literature on such matters has focused primarily

on the concept of energy justice, an ethical approach grounded in care can, in theory, reflect the reality of dependence that characterises energy politics on a global scale (Damgaard *et al*.).

If it is true that ‘‘more than anything, the global energy architecture is characterised by a lack of coherence and a lack of authority, not a lack of institutions’’ (Sovacool), then it is of utmost importance that energy governance be handled with responsibility, multiplicity and care to guide a moral energy transition. To think energy with care for values, people and planet is the key for a sustainable energy future. Just as Emmanuel Levinas states, if ethics is ‘‘a responsible, non-totalizing relation with the Other’’, then politics is ‘‘conceived of as a relation to the third party, to all others, to the plurality of beings that make up the community’’ (Critchley, 220). In fact, ethics is ethical for the sake of politics: it ‘‘hardens its skin’’ as soon as we move into the political world because this involves ‘‘a totalizing discourse of ontology’’ (Levinas and Kearney, 21). If the privileged, unquestionable epistemological and ontological basis of our world are not challenged, thereby raising important questions around ethics, responsibility and politics, ‘‘then social action would be no more than the automatic operation of a knowledge, and ethics and politics would be no more than technology’’ (Derrida, 44). That is why ethics must remain the first philosophy (Levinas, 29).

PART III: POLICY

If we are genuinely interested in doing justice to the complex workings of energy politics in relation to people, places and cultures, then it is essential to turn to the particular: for this reason, the tripartite framework of cosmotechnics will be here employed to prove its utility and applicability through illustrative empirical examples. This will demonstrate that the framework not only offers new ways of imagining solutions to current global challenges, but is also able to respond to the peculiarity of each one of these by conceiving of them as interconnected. New policy directions will be suggested in the following section to promote political practices that relate differently to both space and time, to cultural, social, epistemic groups, and to the disruptions, injustices and discrimination underlying various technological forms. In doing so, energy issues are reimagined within a world where alternative ways of conceiving them exist and are practically accessible as global policy directions.

The localised, moral change that is invoked in the previous sections here takes very pragmatic form, suggesting ways in which we can not only reconfigure the politics of energy, but altogether reimagine the world within which this happens. This analysis therefore asserts that there are multiple ways of imagining the world, and to think that we can keep sustainably pursuing our energy needs with a fossil-fuel mentality is merely an error in perspective. What needs to be done is to find new ways of interacting, using and relating to energy to reproduce a more fundamental idea of progress altogether. Herein, a theoretical framework that is able to comprehensively and ethically respond to these challenges has been proposed: the following policy directions illustrate some ways in which this framework may be put into reality.

COSMOS

To begin with, our cosmopolitics must account for the profound pluralism intrinsic to our world. On a global scale, this may be enacted by recognising an unfolding of space and time where justice is extended to non-human entities and future generations, thus moving beyond hierarchies and oppression by including other species, different entities and distant generations.

Nature: Environmental Rights

In 2008, the people of Ecuador amended the seventh chapter of their Constitution to incorporate and recognise the rights of Pachamama, the divine incarnation of nature according to their indigenous cosmology: citing Article 71, ‘‘Nature or Pachamama, where life is reproduced and exists, has the right to exist, persist, maintain itself and regenerate its own vital cycles, structure, functions and its evolutionary processes’’ (Republic of Ecuador Constitution). This example embodies an alternative world-view to the ontological monism of the Western imaginarium, embracing an eco-centric perspective and applying this to environmental politics. The article enforces that ‘‘all persons, communities, peoples and nations can call upon public authorities to enforce the rights of nature’’, representing the first formalised constitutional provision in the world recognising the rights of nature (Tanasescu). Since then, many other legislations have come into place, such as the National Environment Act, the first African national law recognising natural rights in Uganda, or the Constitution of Mexico City appreciating ‘‘ecosystems and species as a collective entity subject of rights’’. In 2017, the Whanganui River in New Zealand, along with

three other rivers, won legal rights. The Parliament of New Zealand formalised such commitment in the Te Awa Tupua Act, declaring the river's status as a legal person and appointing two guardians: one representative of the Māori people and one of the government, in an attempt to reconcile two cosmologies that inhabit this place. By recognising not only the intrinsic value of environmental entities but also their spiritual and material meaning for different peoples such as the Māori (Mika and Scheyvens), the extractivist logic of standard energy practices may be challenged and surpassed by adopting the fundamental indigenous principle that all things are interrelated. As previously mentioned, this requires ontologically pluralist, anti-universalist, techno-diverse processes that reflect the multiple forms and ways of life on this earth. Thinking about cosmologies as plural can help create multiple and diverse solutions to global issues: more particularly, granting rights to nature can contribute to recognising the different meanings that this may carry. On a global scale, there have been a Universal Declaration of the Rights of Mother Earth on behalf of the World People's Conference on Climate Change and the Rights of Mother Earth (PWCCC), and a Call for a Universal Declaration of the Rights of Nature with consultative status within the UN. *The institution of legal recognitions of nature's status can help incarnate profound ecological responsibility and cultivate collective solutions to environmental questions, whilst recognising multiple cosmologies and alternative human-nature interactions.*

Future Generations: the two hundred year present

According to the Haudenosaunee (also known as 'Iroquois') people, actions are justified insofar as they do not perpetrate negative effects on the seventh generation after them. The cosmology of the Haudenosaunee people is governed by a long-term vision as this perpetuates each action into

the future, requiring one to think about its impact and significance throughout time. Julia Watson claims that this notion may constitute the true origins of what has become known as ‘‘sustainability’’ in the Western narrative, perhaps deliberately neglected and concealed as a form of ‘‘epistemicide’’ due to its techno-spiritual associations to indigenous cultures. The reconsideration of different indigenous cultures, their cosmo-visions and epistemologies may present an important contribution to sustainability when faced with so-called ‘‘wicked problems’’, such as climate change, where facts are changing, stakes are high and solutions are urgent (Kenter *et al.*). The discourse invoking the well-being of ‘‘future generations’’ has been increasingly adopted to raise awareness of the deep effects of a fossil-intensive economy and its associated environmental degradation. This is what the philosopher Roman Krznaric means when he says we have come to ‘‘colonise the future’’, when on the contrary we should learn to become good ancestors by reinventing culture, economics and politics to expand our time horizons in an age of long-term challenges. Creating policies that look beyond the present, liberal and Western-centric cosmology and rather incorporates perspectives (such as the Haudenosaunee) that take responsibility for actions and are accountable to future generations for their repercussions, can present an important tool for addressing the complexity of environmental challenges and global justice. By changing our perspective to include these dimensions, we are able to dilate the world that global energy policy engages with, to render its aims more comprehensive, more veracious, more capable of delivering just planetary living. The UN has announced its commitment to establishing a UN Special Envoy for Future Generations, a Futures Summit in 2023 and a UN Declaration for Future Generations, under the advice of Wales’s Future Generations Commissioner, Sophie Howe, paving the way for an ethic directed towards future generations (Howe). The Well-being of Future Generations (Wales) Act 2015 is, in fact, the first piece of

legislation enforcing legal obligations on public bodies in favour of long-term sustainability and responsibility. *Particularly in the realm of energy policy-making, profoundly intertwined with environment, time and resources, it is essential that normative considerations regarding the impact of practices on future populations must override those considerations solely concerned with profit, contingency and convenience, thus including alternatives that extend beyond the limitations of a present-bound cosmo-vision.*

EPISTEME

Different peoples, languages and ways of life may contribute to the creation of an alternative future: next, we turn to aboriginal and socially marginalised groups, who have been historically left out of decision-making procedures yet carry the potential to enrich the global political imagination with their particular knowledges and understandings of energy.

Aboriginal: Recognising Peoples

Indigenous peoples are more likely to have lower quality of life indicators than the dominant populations in a country, due to unequal rights, poverty patterns, or incompatible lifestyles (Bodley), as well as genocide, land theft, cultural and ecological destruction, physical and other kinds of violence. These facts simply manifest how distinct cosmologies, epistemologies and technologies are able to divide various groups and lead to hierarchical relationships amongst them in the realm of politics. At the intersection of different worlds, in fact, many issues arise: these can

only be addressed if policy looks to build diplomacy, respect and comprehension of diversity. Policy-making, however, is often accountable for promoting cultural domination and forwarding a monoculture at the expense of many communities and ways of life. Green energy policies, for instance, often contribute to exacerbating the cultural domination of indigenous peoples, such as the development of wind farms on Sámi ancestral land (Liljenfeldt). In fact, despite the Norwegian Constitution's 1988 ''Sámi Act'', a declaration of responsibility on behalf of the government to protect and develop the Sámi culture, language and livelihood, and the institution of a Sámi Parliament as a communicative tool between herding community and national representatives, resource developments in the national interest have always surpassed any claims of the Sámi people in Norway (Anaya). The lack of fair, respectful treatment of some groups generally leads to a decline in their participation in planning processes or communities (Schlosberg). Indigenous cultures, however, present an alternative to the contemporary corporate logic of energy extraction and the industrial infinite-growth model of energy in Western cultures (Cariou). As energy is always tied to a particular place and culture, its commodification distances the energy user from their sense of responsibility: for this reason, indigenous theories of energy may sensitise us to environmental costs and contexts, and provide a way forward. What is required for policy is a substantial commitment on behalf of political authorities to recognise the other, respect their values in spite of contrary interests, address the needs required by different ways of life, work together in the creation of solutions and be prepared to change with them. It is in fact essential that low-carbon transitions are based around shared beliefs, resources and values that bring people together around the collective understandings of necessary sustainable solutions (Sovacool *et al*.). A failure to recognise this democratic requirement can only lead to increased injustice and immoral policy making, no matter how clean and green these solutions are. *Establishing ways to communicate*

effectively across ways of life, taking into account the needs of the other, and (in doing so) enacting respect for their values, eradicating forms of political suppression by granting land ownership, resource management, political infrastructures, adequate representation and full-fledged governance to different peoples are some of the steps towards a substantial recognition of noodiversity.

Cut-off: The ‘‘other’’ communities

Another important section of underrepresented groups within the global energy debate include those with disabilities, women, elderly people and the rural poor amongst others (Sovacool *et al.*). Energy precarity more particularly affects people who have a lower or no income at all, including children, young adults, women and elderly people (see Petrova; Day and Hitchings). In order to overcome such issues and create a supply chain that best serves the needs and requirements of groups that are disproportionally affected by energy decisions, a culture of care must accompany the creation of locally-controlled and decentralised energy systems that serve their communities in a democratic manner. The UN Framework Convention on Climate Change reports that women are generally more likely to be poor than men, and as a consequence are more at risk as they have less access to decision-making, resources and information (UNFCCC). Women, however, present a precious contribution in the establishment of care in relation to both people and nature, as seen in the practices of indigenous women in Ecuador’s petroleum circuit where ecologies and cultures are being displaced by oil projects (Cielo and Sarzosa), thus being more attuned to both social and environmental needs. Feminist approaches, in fact, can offer expertise in the study of power and more ethically navigate the tangled webs of power, profit and technological innovation that

characterise energy systems (Bell *et al.*; Bear *et al.*). This involves finding alternative ways of living together, such as co-housing developed in the 1960s in Denmark (see Larsen); transforming food systems through agroecology, fair access to land, solidary economies and sovereignty (see Agroecology Map), and envisioning a just and regenerative global economy in service of localised needs and endemic resources (Schumacher). Today, policies mostly promote energy systems that are centralised and controlled by large corporations. Understanding how different people, different ways of knowing, thus different ‘‘epistemes’’, relate to energy contributes to the creation of policy that is inclusive, comprehensive and works for all. Shifting from investor-owned and fossil-fuel based utilities to smaller, decentralised, locally-controlled, community-owned renewable systems can only be achieved through overhauling subsidies and incentives, legalising community-based energy projects, supporting locally-centralised democracy and constraining energy monopolies (Local Futures). This entails a change in perspective due to the fact that energy is considered not only in reference to its market or power profitability, as in the current general understanding of global politics, but also to its moral and social implications. Recognising the plurality of knowledges underlying the practices of different groups across cultures, but also within them, can contribute to the pursuit of an ‘‘ecology of knowledges’’, where a full range of human knowledge is able to provide alternatives and visions that deal with global challenges differently. In order to create energy systems that work for the whole of society, including the socially marginalised, an invigorated democracy must allow for local communities to access more power, control and influence over decisions involving them. *Policy changes in such direction will promote increased participation, practices of mutual interdependence and a culture of care, therefore advancing epistemological diversity and energy systems that function for the whole of society.*

TECHNE

Finally, the question concerning technologies requires deepened normative judgements on behalf of policy-makers with reference to place, power, innovation and efficiency in order to respond to the various challenges of energy. In this section, new approaches to technology, such as lower demand, circular economy and localised production, are suggested to move away from a fossil-fuel mentality and question its presumed necessity and efficacy.

Circularity: between creation and waste

The creation of a circular economy is essential to ensure a sustainable energy regime: this promotes an economic system that reduces resource use and mitigates environmental impact through a radically different organisation of production and consumption practices (Oliveira *et al.*). From a consumption perspective, this also implies reorienting the focus of renewable energy towards more simple, sustainable and effective resources such as weather patterns, human power or food waste, thus paving the way towards less invasive, polluting and degrading technologies. Adjusting energy demand to supply would, in fact, make the switch to renewable energy much more realistic than it appears to be today (De Decker). Evading the fossil economy's strict parameters of consumerism, productivity and immediacy that are dictated by Westernisation, thus the homogenising force of a single cosmotechnics, may help to create more sustainable and diverse ways of interacting with energy needs. This represents a shift away from the linear way of understanding consumption, characterised by mass production and waste, and rather reimagines how renewable energy may address issues that are intrinsic to the globalised liberal economy. The renewable transition,

however, requires a great amount of critical materials including rare earths that may pose new challenges for energy security, sustainability and justice: an electric car in actual fact requires six times more mineral inputs than conventional cars (IEA). According to the IEA, this may imply the quadrupling of mineral requirements for energy technologies by 2040 to meet net-zero demands. The increased demand for commodities such as lithium or cobalt, mined primarily in Democratic Republic of the Congo, Chile, Argentina and Bolivia, has been associated with exploitation, overlooking of workers' rights, environmental damage and scarce materials in these places (Sovacool *et al*.). By recovering, recycling and reusing metals from electronic devices, not only questions of scarcity, but also of global justice may be ethically addressed. Similarly, the employment of low carbon materials from secondary sources may help address the challenges of emissions in material production phase, which may soon account for 60% of their total lifetime emissions (WEF). The disposal, recycling or life extension of renewable technologies should be factored into the design process, to create a truly sustainable energy regime. The proliferation of electric vehicles, for example, epitomises the issues embodied by these renewable, but unsustainable solutions: the manufacture of batteries, extraction of materials, transportation at the production stage, as well as the limited recycling capacity of batteries and waste stream of old fossil-fuelled vehicles towards poorer markets (UNEP) substantially offset the potential benefits of moving away from the ''transportation monoculture'' of gasoline-powered automobiles (Sayre). Imagining ways in which waste can be converted into energy as in Sweden (Ericsson and Nilsson); cocoa waste can fuel Ivorian biomass plants (Ngounou); Scottish seaweed can power a car's 50-mile journey (DTI); or gallons of confiscated alcohol can be turned into biofuel for transport (Schwede *et al*.), not only reduces carbon emissions through cleaner alternatives, but also creates new ways of recycling, conceiving and consuming energy. In fact, ''by equating what is

‘required’ with what is ‘normal’ we actively support escalating expectations of need’’, whereas achieving a change in demand, production and disposal ‘‘entails challenging embedded norms rather than following them’’ (Walker *et al*.). *A circular economy should be implemented to move beyond excessive production and waste: turning to locality, circularity and alternative resources may present a way to embrace technological diversity formed around contingent geographies and to sketch planetary solutions to localised needs.*

Power: overcoming the extractivist paradigm

Prioritising extractive modes of resource management, such as mining, oil, gas, forestry and fisheries within the political economy is termed ‘‘extractivism’’ (Wilson and Stammler). Extractive industry practices create pits and scars that leave landscapes derelict, as natural resources are extracted from the earth (Gupta and Chatterjee). The consequences of such processes are both environmental, thus severely altering landscapes and leading to land degradation cycles (Sahu and Dash), and social, as the processes of governing resources, including knowledges and actions, perpetuate injustice, oppression and exploitation on a global scale. In fact, although poorer countries supply important amounts of raw materials to higher-income countries, the latter obtain significantly higher revenues for the resources they export than the former, which ‘‘is mostly due to the positions occupied in global supply chains and their respective roles in the world economy’’ (Dorninger *et al*.). This logic, however, is not limited merely to the extraction of raw materials from the ground, but also involves the cumulative effects of other practices such as seabed mining (Silva), how we create new ‘‘Silk Roads’’ to promote connectivity across great distances (Winter) or even the way decentralised renewable systems rely on damaging, extractive components therefore leading to ‘‘solar extractivism’’ (Bouet). Extractivism is not merely about how resources

are drawn out from the depths of the planet, but is profoundly intertwined with the practices of privatisation, liberalisation and competition: it is essential that renewable energy be untangled from this extractivist logic, dominating the Western way of life, in order to ethically fulfil environmental, social and global needs with energetic responsibility. This, however, comes with deep questions concerning power, paradigms and systems. Echoing the words of philosopher Vincent Blok, an important question that should be accompanying us on the way towards good climate and energy policy is this: is technology really the problem, or rather its linking to a specific economic vision, namely that which rests at the heart of Western cosmology? If it is true that to replace fossil fuels with renewables, ‘‘one kind of digging must be replaced by another’’ (Montevecchio), thus that mining is necessary for renewable energy, the ethical question must become how can its human and environmental costs be alleviated and how can local communities, rather than governments or corporations, have enough political and economic power to appropriately respond to mining requirements. In this context, empowering civil society by including affected people, local knowledge and ‘‘social licences to operate’’ can counterbalance the ‘‘extractivist’’ imperative, thus ensuring solutions that are sensitive to different epistemologies as well as long-term sustainability risks, and create better conditions for local livelihoods and environment. *Local empowerment is the key to overcome the harms of extractivist industry developments that are linked to a specific economic vision propounded by the Western cosmology, and move towards alternative solutions.*

Resources: Localising Energies

Understanding geographical energy systems presents a way of tightening the connections between world and human, local and global dimensions (Bokor). As previously mentioned (Massey), locality

is where particular cosmologies, epistemologies, technologies are produced, but also where the global is constructed. These however are inevitably intertwined with the environment yet engage with it differently, according to contexts and circumstances. In order to bring forth efficient and secure energy production, the entire energy system must be founded upon the recognition of diversity formed by the variety of resources naturally occurring in specific areas: local demands, industry and economy should be shaped according to these resources, therein making it possible to integrate them into the global sphere and promote cooperation as a working mechanism. Due to varying regional conditions, different techniques are essential to provide effective practical solutions. The considerable costs of extraction, manufacture and transport of raw materials, especially when traded and transported across long distances, should be reconceived in a way that does not harm local economies and environments and makes our energy systems more accessible and resilient. Local energy production, but also alternative strategies (such as smaller-scale approaches, decentralised energy, community energy, local networks, practices and agency) and energy sources, must be further explored to respond to the changing role of geography. For instance, despite its environmental costs, the employment of peat deposits may present a strategy to phase out oil-fired thermal power and ensure sufficient and reliable electricity access in Rwanda (Mugerwa *et al*.) whereas, due to contextual factors, the need for peatland restoration may surpass the traditional use of peatbogs for revenue or domestic consumption on the Isle of Lewis, in Scotland (POI). Looking towards other natural energy sources such as the sea, may be embraced in favourable locations such as the Mediterranean (EAI), following the increased exploration of tidal and current power in Scotland, Spain, Portugal and the Netherlands (OEE). Similarly, geothermal power can be employed to sustain local needs as in Iceland, where 9 out of 10 homes are powered by the island's geothermal energy (Logadóttir). The peculiarity of geographical and local resources may help not only reduce processes of transportation and political contestation, but

also benefit the environment, foster local empowerment and public engagement in energy processes, and promote long-term renewable energy implementation. It is essential to trace the changing nature of resources as they move ‘‘from element to condition and from an experience into a resource that generates power and its effects’’ (Howe, 24) to best respond to the consequences of such changes. *Local natural sources should be privileged to promote a decentralised and socio-environmentally connected strategy of energy production to overturn the current energy system and transition towards a more sustainable, localised and moral energy production, thereby grounding the project of technodiversity.*

EPILOGUE

To conclude, after having presented a philosophical and moral framework for energy decisions within which technodiversity is able to thrive, some energy solutions have been proposed to address ethical, environmental and social concerns hindering energy justice. As the objectives of energy justice are multiple and multifaceted, they require multiple and multifaceted policies and perspectives that foster ‘‘a world in which many worlds fit’’ in order to successfully address them.

The recognition of how cosmologies, epistemologies and technologies interact in the creation of energy cultures is essential to address ethical issues that may arise in an ever-more interconnected planet. This exploration has been undergone with a deep acknowledgement of the difficulties that are central to energy systems, without denying them: nonetheless, if these considerations are incorporated into energy design, thus working with the recognition of the present challenges rather than against them, then more space is left for ethical decisions. Building more ethical energy systems means imagining alternatives, questioning present values, recognising otherness and creating a world where energy is not merely conceived as a commodity but rather as a central component of human life which profoundly shapes and interacts with it, often creating destruction, hierarchies and oppression. As our ethical considerations harden their skin in the realm of energy politics, we must remember that the impacts of global policy in the current energy transition are ‘‘not only written in the clouds and expressed in the atmosphere, but spilled in blood, sweat, and tears’’ (Sovacool).

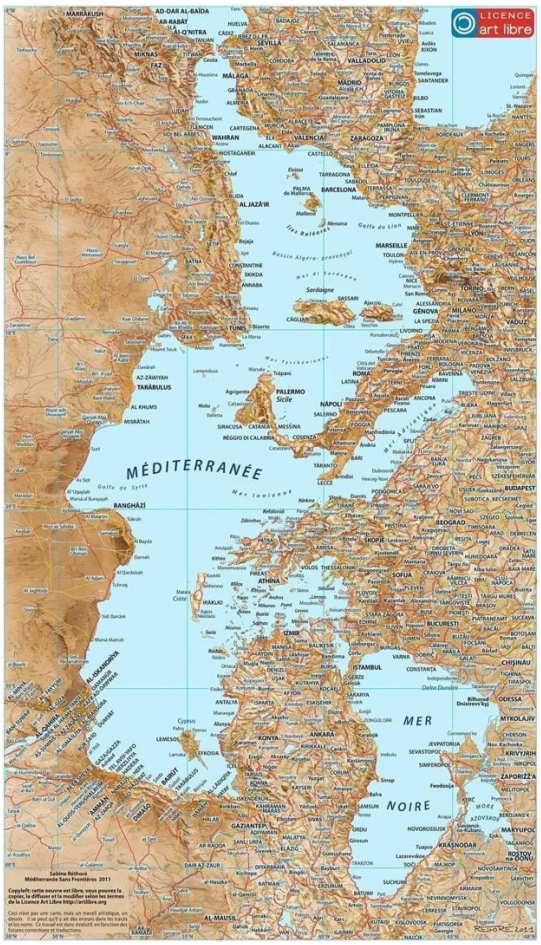

Figure 2: *Méditerranée Sans Frontières*. Map by Sabine Réthoré, 2011.

The geopolitics of energy should not be mapped according to the profit and convenience that come between people, but rather on the enriching potential of diversity. To echo the cartographer of yet another alternative map, our change in perspective should ‘‘not draw the borders that divide us, but the thousands of roads that connect us’’ (Réthoré). For this reason, technology must be declined according to different localities or understandings of the world, fostering diversity and enriching planetary thinking in the project of technodiversity. Particularly in times of great socio-environmental challenges, progress must be understood in the crudest way as a process against scarcity, exclusion and violence: this exploration has implicitly grappled with this question, yet

also set forth ways in which this can be achieved. Interacting with diversity on a global scale presents localised political opportunities to question how this transition towards a sustainable future ought to take place and consider alternative methods of energy development. A wider debate on the local dimension will be able to enrich and extend the collective political imagination, shedding light on what an alternative energy future should look like.

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