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AFTER FOSSIL MODERNITY: TOWARDS NEW ENERGY REGIMES AND NEW SOCIAL SCIENCES

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Sociology is a late child of western modernity. As an institutionalised system of knowledge, it was born of accelerated urbanisation, the spread of capitalist labour relations, and other fundamental social changes that were part of the overall process known as industrialisation (Smil 2018). Machines powered by energy from burning fossil fuels – especially coal and oil – were the driving force of the process. The western societies studied by the classic thinkers of sociology were formed on this basis.

Not only did the use of fossil fuel energy increase production, it also accelerated the circulation of goods and people. European expansion would not have been possible without these resources and the "invention of speed" (Studeny 1995). Colonial empires, whose bloodstream consisted of sea and land transportation routes secured by armies moving at unprecedented speeds, could not have been built (Ward 1994; Birtchnell et al. 2015). The forced or voluntary mobility of people – migration for work, education, or better living conditions on the one hand, and travel or tourism on the other – were associated with the development of public and individual means of transportation. In this regard, the best metonymies of modernity are the train and car. While they use different kinds of fossil fuel (coal and oil), both have permanently shaped our civilisation (Seiler 2008; Esposito 2020).

The energy from fossil fuels, which has various forms and many practical applications, can also be understood metaphorically. It is a powerful force that often goes unnoticed yet sets entire societies in motion. Never in the history of the world has social mobility – both vertical and horizontal – reached such a scale. From the beginning, the energy that powers industrial societies weakened the assignment of individuals and entire groups to their place in the social structure. In the capitalist, industrial economies of Europe and the United States the importance of coal meant that a specialised part of the working class – the miners involved in extracting the coal – controlled the supply and thus gained a measure of subjectivity at the price of their perilous work (Mitchell 2013).

Currently, there are many indications that we are in the midst of another civilisational change. It involves a planned and forced shift away from "fossil modernity" (Folkers 2021), that is, an economy based on an energy industry that relies entirely on fossil fuels. It is impossible for the process to take place without social and political consequences, although it is very difficult to foresee all of them today. For this reason, energy research is a fascinating field for the social sciences and humanities, as the texts in this issue of *State of Affairs* compellingly illustrate. We can see how energy research serves as a test that reveals the strengths, limits, and dilemmas of our present-day social sciences and humanities, while also pointing towards possible developmental trajectories in the years or decades to come.

Four features of this research field contribute to its significance. First, it compels us to pay attention to material infrastructure in analysing stability and change, and causes us to question approaches that are blind to this dimension of reality (Smil 2023). Second, as the heart of economies, the energy industry is and will continue to be a political and geopolitical issue – not only due to specific technologies but also due to the geography of energy grids (Yergin 2020). Third, this research field entails the challenges of interdisciplinarity and transdisciplinarity: the understanding of complex systems often requires the integration of methods and insights drawn from various academic disciplines and fields of practice (Loorbach et al. 2017). Fourth, it raises dilemmas of neutrality and engagement. In the face of the climate crisis and the realisation that change in the energy sector is among the most crucial responses to it, energy researchers may find themselves compelled to adopt new roles and new forms of collaboration with other actors – or they may refuse to answer this call and strive to remain neutral. We believe that the present issue of *State of Affairs* will appeal not only to scholars directly engaged in energy research, but also to

a broader readership interested in the challenges and future of our evolving disciplines. At the same time, the significance of the topic for our collective future extends to all those who are concerned with energy not only as scholars but also as citizens and users.

How do the texts in this issue shed light on these tensions and dilemmas? Rather than summarising each article, we will provide a brief overview of how some of the texts engage with the fundamental challenges of energy research. In doing so, we aim to highlight the diversity of the research perspectives we seek to celebrate. As editors, we do not align ourselves with any particular stance, although some are closer to our views as authors and researchers than others.

From its very beginning, social and humanist research on energy has attracted scholars from a wide range of disciplines – from historians and sociologists to philosophers and cultural theorists. A frequent analytical approach conceptualises energy systems and their related institutions as a "seamless web" (Hughes 1986): a co-evolving arrangement sustained by the alignment of technologies and institutions that emerged within specific configurations of power but have since acquired a resilience of their own. This perspective powerfully foregrounds questions of structure and agency, continuity and change, particularly, though not exclusively, in the context of the urgent call to move away from fossil fuels. At the most fundamental level, such research acknowledges the role of fossil fuels in modern civilisations. Adam Hanieh's book *Crude Capitalism: Oil, Corporate Power, and the Making of the World Market*, which is reviewed in this issue by Bartosz Matyja (2024), falls within this line of inquiry. It shows that material infrastructure is the underlying fabric of the current power structure. This perspective makes any discussion about changing energy systems – or altering our relationship to energy itself – a conversation about the altered future of modern societies in a zero-carbon version. Bartosz Kamiński (2024) explores the topic in his article "The Energy Transition Is Just the Tip of the Iceberg." Michael Marder's book *Hegel's Energy: A Reading of* The Phenomenology of Spirit (2021), reviewed by Bartosz Wójcik (2024), takes this consideration to an even higher level of abstraction in proposing a reimagining of Hegelian dialectics ("reframing energy as the ontological and material core of Spirit's unfolding"), while at the same time addressing pressing socio-political and ecological crises.

However, it is not always necessary to remain at the level of questioning fundamental systemic change. At times, the tools of the humanities and social sciences are employed to better understand where such change

might begin. This is what makes research on the social aspects of energy so compelling. It enables us to ask both about the future of capitalism and about a district heating plant in a provincial town, and to work to make them part of the same conversation.

In this vein, Błażej Popławski in his article "Lifting the Resource Curse in Africa's Energy Sector" (2024) systematically examines how history and institutional structures have shaped the processes and outcomes of fossil fuel extraction in Nigeria, Angola, and Ghana. He seeks to identify what kinds of changes are needed to ensure a more equitable distribution of the benefits arising from these processes. Discussion of the different relationships that energy production has created in certain places is inextricably linked to the broader discourse on overcoming the legacy of colonialism.

In "Transforming Energy Systems, Transforming Social Science" Agata Stasik and her co-authors (2024) explore the role of social scientists in collective action aimed at reconfiguring technologies, institutions, identities, and interests, in order to replace specific fossil-fuel solutions with low-carbon alternatives. They conceptualise this process as collective experimentation. Their approach resonates with Alexis Shotwell's (2016) notion, referenced by Maja Rup, of "shaping unpredictable futures" – a framework that rejects the illusion of full control, ideological purity, and linear progress. Instead, it advocates for building the future through an embrace of complexity, interdependence, and action in the face of uncertainty. Jerzy Stachowicz draws attention to the role of imaginaries and imagination as resources for shaping new configurations. He investigates the kinds of energy to be found in Polish science fiction of a century ago (Stachowicz 2024).

Framing the energy system as a configuration built on interwoven infrastructures and institutions emphasises its role as an invisible foundation for both everyday practices and entrenched relations of power and exploitation. This perspective is one of the main reasons why many energy scholars are compelled to move beyond traditional disciplinary boundaries. The tendency is evident in several outstanding works reviewed in this issue. For example, Szymon Wróbel writes in his review that the book *Energy and Experience: An Essay in Naftholog*y, by Antti Salminen and Tere Vadén (2015), is "a beautiful example of transdisciplinary and openly anti-disciplinary thinking […] that emanates […] freshness and […] courage and power of thought. […] The authors combine reflections from the fields of economics, engineering, sociology, history, and, above all, philosophy" (Wróbel 2024: 288). The contribution of the philosopher Ewa Bińczyk in her work *Uspołecznianie antropocenu* is equally significant and is reviewed here by Andrzej Frelek. The

book explores the promises of post-growth as a fitting response to the planetary environmental crisis and delineates a new intellectual and practical field shaped by insights from planetary science, ethical reflection, economics, social research on systemic transformations, and other areas. Similarly, most of the authors appearing in our issue consciously draw on the insights of multiple disciplines. Błażej Popławski, in "Lifting the Resource Curse in Africa's Energy Sector" (2024) employs a multidisciplinary perspective grounded in history, economics, political science, and development studies. Maja Rup in "Energy Ethics: The (Im)Purity of Renewable Energy Sources. An Analysis of Offshore Wind Farms in the Baltic Sea" (2024) works within the framework of energy humanities. She engages with critical posthumanism and feminist new materialism to understand ethically problematic issues and to identify the most vulnerable points and the actors most likely to be affected by the new "green energy" projects. This allows her to bridge the discussion about the possibility of simultaneous economic growth and ethical energy production with an analysis of a specific case. Katarzyna Iwińska (2024) presents a detailed analysis, operationalisation, and empirical application of the concept of "energy citizenship." Although the term was originally proposed by a scholar affiliated with social geography, it currently crystallises debates, research, and policy proposals across the broad field of "social studies of energy," which brings together sociologists, anthropologists, economists, and public policy scholars, among others.

The book *Climate and Energy Politics in Poland: Debating Carbon Dioxide and Shale Gas* by Aleksandra Lis (2020), which is reviewed here by Claudia Foltyn (2024), also crosses disciplinary boundaries. It employs analytical concepts from science and technology studies to examine how new entities, such as carbon dioxide and shale gas, reshape knowledge production and governance structures at the local, national, and EU levels.

In this context, the article by Radosław Tyrała and his co-authors, "The Grassroots Energy Transition in Poland through a Sociological Lens" (Tyrała et al. 2024), stands out. Although the research they discuss was conducted as part of an interdisciplinary and practice-oriented KlasER project, they remain consistently grounded in the concepts and theories of sociology and explore which classical approaches best capture the dynamics observed in the field. Paradoxically, adhering strictly to the methods and language of a single discipline has become the exception.

The dominance of inter- and transdisciplinary approaches stems in part from responses to how climate science findings on fossil-fuel use will affect the social sciences: their purpose, their criteria for success or

excellence, their methods and theories. Energy research is thus a fascinating prefiguration of a possible future for the social sciences.

Stasik and her co-authors address this issue directly. They note that a significant portion of contemporary energy research assumes an engaged stance, with researchers actively supporting processes of transformation. At the same time, by adopting this role, researchers are faced with a range of new expectations, for which they are not always well prepared, and which may not be fully supported by the institutions that hire and evaluate them, or by academic promotion systems that are still largely oriented towards traditional disciplinary achievements. Nevertheless, the authors do not abandon the idea of new roles for social research in the processes of socio-technical change but rather advocate for greater institutional support for such risky experimentations.

The texts published in this issue remind us, however, that if the humanists and social researchers who engage in the energy transition are motivated by an awareness of the harmful consequences of fossil-fuel dependence, this does not necessarily imply their support for current decarbonisation policies. On the contrary, many writers reflect critically on the blind spots and dead ends of present efforts towards change, particularly where these fail to adequately address the violence, injustices, and inequalities produced and sustained by the existing solutions. The insufficiency of "green energy" projects is directly confronted in the article "The Tainted Shadow of the Green Revolution: The Cobalt Conundrum in the Democratic Republic of Congo" by Błażej Popławski and Roman Chymkowski (2024), which exposes the realities of cobalt extraction in South Africa. The authors' analysis sheds light on the often-overlooked material foundations of so-called clean technologies and reveals the new forms of suffering and exploitation that are entailed in producing them. Similarly, in analysing the development of offshore wind farms in the Baltic Sea, Maja Rup argues that limiting the energy transition to a mere substitution of one energy source for another, without addressing non-emission environmental impacts and social justice concerns, will cause the transition to fall short of its promises. On the other side, in the book *Gaz łupkowy w Polsce. Historia, magia, protest* (Szołucha 2021), which is reviewed in the issue by Anna Ptak (2024), Anna Szołucha draws on anthropology, political ecology, and critical social theory to remind us that projects involving exploration for fossil fuels may also harm local communities.

The analyses offered by these authors point again to the broader and more fundamental questions explored in Bartosz Kamiński's article and in

Ewa Bińczyk's book (reviewed in this issue): namely, whether a successful energy transition is possible only if it involves radically reducing energy consumption and abandoning the pursuit of constant economic growth. But even if the ethical case for such a shift is compelling, how might it actually be implemented and administered? This question brings us back to the first key feature of the energy humanities and the social sciences: the issue of structure and agency, stability and change, and the need to understand the mechanisms of a deep socio-technical transition.

We hope readers will find this collection of texts, which give voice to a wide range of positions on researcher engagement and the theoretical and methodological choices that it entails, worthwhile.

The texts in the first part of the issue exemplify the different roles that researchers have adopted in relation to the transformation of the energy system. This variety of perspectives reflects the richness and complexity of the ongoing discussions about the role of science and researchers in the context of socio-technical change. Agata Stasik and her co-authors view researchers as supporters of energy-transition initiatives. In order to provide possible solutions, such researchers should not only draw on social theories and methods, they should also, most importantly, collaborate with field actors. Katarzyna Iwińska offers an in-depth review of the meanings of "energy citizenship" and discusses the research tools and empirical findings derived from the term. She explicitly aims to support a just and democratic energy transition, though her article does not employ a co-creation framework. Błażej Popławski, by analysing the historical and institutional conditions of the "resource curse," seeks to make recommendations that could lead to positive change in regions whose development trajectories have so far failed to ensure a fair distribution of benefits from resource extraction. Radosław Tyrała and his co-authors do not set goals related to assisting the transition. Rather, they aim to understand the dynamics of energy-related processes by applying classical sociological concepts, such as the "sociological void" and "apparent actions." While their conclusions may have practical implications, this is not their explicitly stated focus.

In the second part of the issue, we invite readers to consider a form of critical, engaged scholarship that interrogates the project of sustainable/clean/green transition and points both to its local failures and to the conceptual contradictions inherent in the pursuit of green growth. Bartosz Kamiński contrasts the liberal vision of green growth with the post-growth paradigm. Maja Rup highlights the ethical dilemmas posed by large-scale infrastructure projects undertaken in the name of green energy. Błażej

Popławski and Roman Chymkowski examine practices connected with cobalt extraction in the Democratic Republic of the Congo and reflect on the implications of these for the broader vision of a green transition. Finally, Jerzy Stachowicz, while not addressing the limitations or disappointments of the green transition directly, offers a historical review of imaginary energy futures and reminds us of the crucial role that imagination and shared visions have played in opening new paths for transition.

Finally, it is important to emphasise that while we hope this issue offers an interesting overview, it should not be regarded as a comprehensive survey of the most significant trends in energy research either in Poland or globally. Analyses of several critical topics, such as the challenges and strategies of coal-transitioning regions, energy poverty, or the development of nuclear energy, are notably absent. However, some of these topics can be found in the included transcript of a discussion between academic sociologists and energy experts with sociological backgrounds. In the discussion, which was moderated by Marta Stumińska-Kutra and centred on Agata Stasik's book *Przełamać klincz węglowy. Zbiorowe eksperymentowanie wokół zrównoważonej transformacji*, Aleksandra Wagner, Radosław Tyrała, Kamil Lipiński, and Marta Anczewska reflect on the usefulness of the concepts of carbon lock-in and collective experimentation for understanding and changing the energy landscape. This discussion helps readers better understand how current dilemmas in transforming the energy system in Poland can be viewed through the lens of changing social-science disciplines, and also to see the risks of experimenting with engagement and transdisciplinarity. With that, we would like to invite readers to continue following – and contributing to – the growing fileds of social studies of energy and energy humianities by sharing insights that inspire both critical thought and transformative action.

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