Energy Humanities in Practice

Teaching, Technology, Transition

Various Authors

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In 2017, Imre Szeman and Dominic Boyer published the celebrated edited volume, *Energy Humanities*, which defined this new interdisciplinary field for the first time.[1] Since then, much of relevance and consequence has happened that Szeman and Boyer could not have predicted: COVID-19, the Russian invasion of Ukraine and its implications for European energy systems, the changing discursive contours and stalling of the green transition, increasingly erratic global climatic patterns—causing natural and human disasters all over the world such as the recent prolonged dry spells in southern Africa, wildfires in Canada and California, or flooding in Europe—and the continued rise of climate-denialist and hyper-extractivist populism. These developments and their geopolitical and cultural ramifications only add urgency to the energy humanities project.

As the contributors in the series here agree, humanity is indeed at a crossroads. As part of the multifaceted approach necessary to face the present conjuncture, it is useful to consider both how energy has led us to it and how it may help us find a way out of it. Whether on the producing or consuming side, today's societies across the globe all depend on energy, which, following Timothy Morton, is so complex, encompassing, pervasive, inextricable, and lasting that it is a veritable "hyperobject," too expansive to fully conceive of even as it unceasingly impacts our world in noticed and unnoticed ways.[2]

Harnessing and exploiting energy requires the use of technology, so that energy humanities as a field is based in part on studying technologies: the many ways we imagine and interact with them, and the myriad intended and unintended effects they have on the world. Hence, while his work does not directly address energy, Jürgen Habermas's theorization of technology can serve as a lens for a clearer reading of our carbon-intensive era. In the late 1960s, he drew from critical theorists before him to analyze the depoliticization and subjection of society promoted by the reification and deification of technology and science.[3] Since Habermas's writings, many have continued to view

[1] Imre Szeman and Dominic Boyer, eds., *Energy Humanities: An Anthology* (Johns Hopkins University Press, 2017).

[2] Ibid., 3.

[3] Timothy Morton, *Hyperobjects: Philosophy and Ecology after the End of the World* (University of Minnesota Press, 2013).

large infrastructural and energy systems not as apolitical, technological arrangements but as complicated networks that actively transform not only nature but also society based on distinct ideological visions.[4] Infrastructure and other forms and practices of technology are the very means by which energy has been exploited and consumed since the industrial revolution, and as Timothy Mitchell has shown, these practices also stand as a physical and discursive *dispositif* for exercising (bio)political power.[5] Similar pretenses to positivism and the structures of governmentality built around these pretenses have underpinned seminal works on the precarities and instability—or "liquidity"—of modern industrial and post-industrial societies.[6] Building on these and related analyses, scholars across disciplines have begun interrogating the continuum of energy exploitation, global warming, and carbon-dependent culture. In the process, they have shown how mammoth a task breaking out of the current carbon-capitalist order could be.

In the series here, all the authors in one form or another place technology at the heart of energy humanities as they answer questions about the risk and vulnerability produced by our modern, technocratic, and carbon-intensive production systems and lifestyles. In parallel, they propose possibilities for outlasting the current energy crises and associated social transformations, environmental disasters, and human-driven climate change. Together, they provide composed and flexible responses to Boyer and Szeman's call to "first, grasp the full intricacies of our imbrication with energy systems (and with fossil fuels in particular), and second, map out other ways of being, behaving, and belonging in relation to both old and new forms of energy."[7] Importantly, three of the texts invoke the specific role of education, whether in formal terms at institutions of higher learning or informal terms through cultural projects aimed at lay audiences, as education serves as a conduit and catalyst for a committed engagement with carbon pasts, presents, and futures. The remaining reflections seek to untangle the ways in which societies face their respective petro-dependencies—practically or intellectually—to imagine possible paths away from the current moment of anthropocentric resignation and instead towards greener and more equitable and democratic futures.[8]

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[4] See, for instance, Jürgen Habermas, "Technik und Wissenschaft als ‚Idologie': Für Herbert Marcuse zum 70. Geburtstag am 19.VII.1968," in *Technik und Wissenschaft als "Ideologie"* (Suhrkamp Verlag, 1969).

[5] See, for instance, Nikhil Anand, Akhil Gupta, and Hannah Appel, eds., *The Promise of Infrastructure* (Duke University Press, 2018); and Dirk van Laak, *Lifelines of Our Society: A Global History of Infrastructure* (MIT Press, 2023).

[6] Timothy Mitchell, *Carbon Democracy: Political Power in the Age of Oil* (Verso, 2011).

[7] Ulrich Beck, *Risk Society: Towards a New Modernity* (Sage Publishing, 1992); Ulrich Beck, *World at Risk* (Polity Press, 2007); Ulrich Beck, *The Metamorphosis of the World: How Climate Change Is Transforming Our Concept of the World* (Polity Press, 2017); and Zygmunt Bauman, *Liquid Modernity* (Polity Press, 2012).

[8] Paulina Jaramillo, Suzana Kahn Ribeiro, Peter Newman, Subash Dhar, Ogheneruona E. Diemuodeke, Tsutomu Kajino, David S. Lee, Sudarmanto Budi Nugroho, Xunmin Ou, Anders Ham-

mer Strømman, and Jake Whitehead, "Transport," in *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, IPCC, 2022, 7–31, https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_FullReport.pdf (accessed May 19, 2025).

Libraries and Laboratories: Teaching Energy Humanities in Literary Studies

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Energy is more than a topic

Energy is more than a topic. According to Imre Szeman, energy "should not be seen as simply another field to add, for example, to the environmental humanities... Yet, this characterises a great deal of what has gone under the name of energy humanities to date."[1] Academia separates disciplines, designates research areas, and defines methods. With the rise of energy as an academic concern, these mechanisms have produced *energy humanities,* as we find them in our curricula today, but in a form that, to some extent, seems institution-washed.

The Russian war on Ukraine shifted the focus in the academic landscape: Energy became, from one moment to the next, a matter of concern. Academic institutions across Europe reacted to the war, and energy as a *topic* flourished at universities. From my perspective as an early-career researcher in Germany, this new focus holds true in the sense that suddenly, research funds have been directed towards the institutionalization of energy as a topic in literary and cultural studies. While this is exciting for me—securing part of my academic future—I often come back to Szeman and his claim that, "The aim of the energy humanities was always greater than this," and that their

[1] Imre Szeman, "Towards a Critical Theory of Energy," in *Energy Humanities: Current State and Future Directions*, edited by Matúš Mišík and Nada Kujundžić (Springer Nature, 2021), 26–29.

intention has been "to unnerve the continuing legibility of the study of history, politics, philosophy, and literary and cultural studies, as presently practiced."[2] However, these practices seem to rarely have been transformed or even touched through the new approach.

For a literary scholar, Szeman's assertion is particularly alarming. In an afterword to *Oil Fictions*, an anthology of petrocultural literary studies, he expresses his concern that "All too quickly... energy has become yet another site or theme for the critical investigation of literature."[3] Accepting the critique, rather than reformulating it, raises the question of how to pursue the new sensibility about energy while striking a balance between theme and practice, especially in a literature that speaks in terms of "topics" most of the time. So, in the winter semester of 2023/24, a small group of students and I embarked on a journey into the literary history of energy to understand that energy is not a topic to be studied in itself but a path into literary studies.

What literature can do for energy humanities

As Dan Tamïr has argued, in times when "humans influence the fundamentals of an entire planet to the degree of modifying entire ecosystems, changing the Earth's atmosphere and climate," everything might be considered an object of human agency. He goes on to state even more clearly that "[I]f everything in our world is influenced by human action, then everything may be considered to be part of the humanities."[4] With this in mind, rather than teaching the literary history of energy as a passive mirror of the history of energy as such, we discussed how historical conceptions of energy and force have shaped the ways in which energy systems has been mutually dependant , institutionalized, and even harnessed. Examples of such institutionalization are seen in the vitalist fluids and the awakening "spark" of Frankenstein's monster (and the imagery of its electric after-life), the visions of hell and of highly industrialized iron factories, or the ways in which we have come to dominate the material world through touch and voice simply because we have developed electrical devices to do so.

[2] What people do not like to talk about is that the academic system, despite all national differences, has become similar to what Peter Fleming calls the "Edu-Factory"(Fleming 36), where (economic or politic) relevance is key to academic survival. In particular, the humanities are fighting for their place in the academic landscape, as they are unlikely to bring home third-party funds. Jumping on the ""energy train" can thus also be a calculated decision in an effort to stay relevant in a system that rewards such calculation; Szeman, "Towards a Critical Theory of Energy," 29.

[3] Imre Szeman, "Afterword," in *Oil Fictions: World Literature and Our Contemporary Petrosphere*, edited by Stacey Balkan and Swaralipi Nandi (The Pennsylvania State University Press, 2021), 268.

[4] Dan Tamïr, "Fats and Spirits: A Story of Modern Humanities' Energy Dependence," in *Energy Humanities: Current State and Future Directions*, edited by Matúš Mišík and Nada Kujundžić (Springer Nature, 2021), 38.

As Szeman notes, a key moment in the energy humanities is when we understand ourselves institutionally and personally "as subjects of energy."[5] In every topic section, the class approached this idea: Talking about crackling wood fires as prestige in Jane Austen's time, we thought about our historical ability to use energy (heat) to become independent of our climatic predispositions——and about how this separation in turn creates vulnerability.[6] We considered work ethics, heavily influenced by thermodynamics, as brilliantly discussed by Cara Daggett in her work *Birth of Energy*. We also addressed how the historical meaning of work influenced students' ideas about productivity and exhaustion, which is reflected in an endless media debate about how Gen Z individuals are not willing to work themselves to death.[7]

Reading Italo Calvino's short story "La pompa di benzina," students discussed how dependent we are on mobility and recharging/fueling cycles—many students stated they had developed an anxiety of leaving their houses not knowing where and when they will be able to recharge their phones and laptops next. Moreover, students showed that even when they were aware of global injustices, they were not prepared to immerse themselves in the fictionalized conflicts (and associated violence) that Helon Habila unfolds around oil exploration in the Niger Delta in *Oil on Water*. Immersing the reader in historically and geographically diverse energy worlds is one of the defining features of literature in the project of energy humanities. Concluding the traditional literary section of the class with the entropic Californian solar farms of Angelika Meier's *Osmo*, the course moved into its last thematic session thereafter: we left printed text and dived into the internet culture of solarpunk and its creative collective dynamics.

"It's hard out here for futurists under 30"

This phrase from *Solarpunk: Notes toward a manifesto* indicates that institutions have reacted differently across faculties and nations to the climate movement since 2017.[8] Certain American universities (e.g., Yale University) have shifted their interactions with students from working against climate denial (qua scientific evidence) to working against climate anxiety—which is difficult to do because the scientific data has not changed. In France, *The Shift Project* maps the range of responses in higher education on the energy transition, calling on France's universities "to make sure that all educational programs are in line with this major national and global project." In the

[5] Szeman, "Towards a Critical Theory of Energy", 26.

[6] This one was not too subtle after Germany was kept in suspense over the course of the former winter by the idea of a heating crisis due to the Russian war on Ukraine.

[7] This debate was quite heated during the time the seminar was offered because a study (pronovabkk) was published about Gen Z individuals and their willingness to call in sick compared to other age groups. An endless debate in columns and the feuilleton followed, some of those were unbearable to read (see e.g. Weidenfeld).

[8] Adam Flynn, "Solarpunk: Notes toward a Manifesto," *Project Hieroglyph*, https://hieroglyph.asu.edu/solar-manifesto

UK, research projects such as "Eco Worrier, Eco Warrior" (Centre for Energy Ethics, University of St. Andrews) consider the emergence of eco-anxiety among young people, including among members of the generation we currently face in the classroom.

Solarpunk is described by Juan David Reina-Rozo as "a movement in speculative fiction, art, fashion, and activism that asks the question 'what does a sustainable civilization look like, and how can we get there?'"[9] As such, solarpunk aesthetics build a space of "counter-cultural hope" in the face of climate anxiety and issues of climate injustices.[10] Solarpunk draws heavily on the aesthetic and social integration of renewable energy systems, as solar, wind, and tidal energy becomes the driver of a post-fossil, post-capitalist society. The challenge is to engage with this transition by analyzing creative solutions, discussing shared ideas for the future, and considering where solarpunk ends and green-washed escapism begins. Whereas the former seeks to address current problems aesthetically, the latter establishes uncritical counter-worlds that are designed to be "green" but offers no awareness of the problem and therefore no answers for current questions such as: How will we live together with other species? How do we solve the issue of rising temperatures without relying on the "lazy trick" that technology will maintain our standard of living against the odds?

For a literary scholar, this challenge means looking at utopian or dystopian tales of sustainable or apocalyptic futures and finding their common denominator. When we read stories about salvation, what do we find are the roles—or rather responsibilities—assigned to us by these stories? What is at the core of post-carbon imaginaries, and what are the paths that these imaginaries take? On what kind of fictive (or historically identifiable) resources do these imaginaries draw? By engaging with the participatory creative dynamics of solarpunk internet culture, additional discipline-specific questions arise for literary studies. How can we (de)conceptualize authorship in this context? What characteristics do genres such as the short story offer that make them preferred forms of expression? Manifestos, for example, have a rich literary history (think of the imagists or futurists), so what do we make of the various solarpunk manifestos?

As a mid-semester assessment, students in my class were asked to write a short reflection on energy. The assignment intentionally left open the scope of the text to be written by students, who were free to address elements brought up in our previous sessions, point to scenarios of their everyday lives and the role of energy in their daily experiences, or simply be creative. Reading their writing was exciting for me. Many reflected on the video games and media they consumed (e.g., pointing at energy levels in mobile farming games or other minigames such as *Harvest Moon* or *Coral Island*). Others wrote about their everyday mobility and friction; and some even wrote short pieces of fiction, of which nearly all were situated in a solarpunk or solar utopic world. Most importantly, the fictional pieces students wrote discussed energy-related issues

[9] Juan David Reina-Rozo, "Art, Energy, and Technology: The Solarpunk Movement," *International Journal of Engineering, Social Justice and Peace* 8, no. 1 (2021): 47, 54.

[10] Ibid., 47.

already encountered in our seminar (shelter, electricity and life, global inequalities, and figurations of work) by translating them into the solution-oriented language of solarpunk. Among all these texts, one competence became legible: the ability to identify historical, energy-related issues *in* fiction and re-engage with them.

Critical energy literacy

At the end of the course program, students completed a final survey whose main objective was to understand how and to what extent they had developed a critical energy literacy, i.e., the ability to identify how energy constitutes the modern world and analyze that world's complexity. One section of the survey was focused on the students' relationship to energy in their everyday lives. Here, less than a third of respondents said that they grew up or lived near an energy production site or experienced energy production as part of their environment. However, alienation from energy production did not stop the remaining two thirds from seeing energy as an essential part of life: students rated electricity higher in importance than heat or mobility as the first energy-related facet that came to their mind. Most students claimed to be capable of identifying whether their practices were energy-intensive or not (showing self-perception). But their interest in individually measurable energy consumption was low, the relationship to energy in everyday life appearing intuitive to this group (57%).

In another part of the survey, the general impact of the course on students' energy awareness was assessed. All students indicated a significant change in this awareness; and these changes could be identified on three different levels. Conceptually, students expressed a more in-depth knowledge of energy physics (71%). This may seem surprising as a result of a literary studies seminar. However, it makes sense since learning about energy means learning that energy is more than a metaphor. Students also reported having a better understanding of the forms of resources and how these function in our societies (57%), as well as a better knowledge of the role of energy in human history and the history of modern societies (28%).

In methodological terms, students expressed a changed understanding of energy as a subject of the humanities. This shift includes the role of energy as a conceptual trajectory in many different theorems in the social and cultural sciences (see e.g. Bourdieu's conversion of capital or Greenblatt's "social energy") and energy's potential applications for new transdisciplinary practices that combine natural science objects and humanities' methods. Many students indicated that energy is a subject that combines literary studies with a minor subject in their overall studies, be it philology or other cultural studies—among those, archaeology and religious studies—social sciences, or natural sciences. In response to an open question asking students to think about such disciplinary synergies, some gave surprising answers, for example pointing to energy as a religious concept and suggesting that energy humanities could also work in the context of religious studies.

In material terms, students stated that they could no longer "unsee" energy in their environment and that they now realized that the availability of energy is a privilege. In addition, they demonstrated sensitivity to energy intensive practices in academia and teaching, as they categorized the seminar's energy intensity as "high" and even acknowledged their own role in energy consumption through their use of electronic devices and commute to and from campus. While students unanimously ranked the natural sciences as the most energy intensive disciplines, they estimated that the energy output of the social sciences and cultural studies was likewise high.

How energy-intensive is teaching energy humanities?

While some may assert that the humanities have "an energetic history of their own," one student during the first session of the semester claimed that the humanities only relied on "books and thoughts."[11] These diverging statements illustrate how different (or not) ideas of energy intensity can be. Students often reduce the humanities to research conducted in libraries rather than laboratories. Written text is a formidable, sustainable resource, if it outlasts its amount of embodied energy.[12] The collected work editions of Jane Austen and Virginia Woolf likely present in any university library and used by many scholars over the years illustrate this point.

Assessing the quantitative and qualitative energy intensity of the seminar means looking at the different levels of academic practice involved. What are our (textual) resources? How do we access them? And what does our working infrastructure entail? With the advent of Open Access and digitization, a digital dimension was added to the humanities' material-based resource intensity described above. Importantly, digitization is a multiplier that creates a vast difference between faculties, research fields, and ultimately national education systems.[13] While digitization promises to level the playing field, the issue of (digital) access isolates institutions as much as individuals within academia. For instance, whether a university provides students with software licenses such as MS Office or Endnote influences the extent to which we can expect students to learn and work digitally and become digitally literate. Although many countries

[11] Tamïr, "Fats and Spirits: A Story of Modern Humanities' Energy Dependence", 38.

[12] In this case ""embodied energy" refers to the notion of "the total amount of energy used during the manufacture and life cycle of a product (esp. a building), considered as being notionally embodied in the product," Oxford English Dictionary. Accessed June 20, 2024.

[13] Miroslav Beblavý et al., *Index of Readiness for Digital Lifelong Learning: Changing How Europeans Upgrade Their Skills*, CEPS Report, 2009, https://www.ceps.eu/ceps-publications/index-readiness-digital-lifelong-learning (accessed June 20, 2024). Germany is a pitiful example of poor political decisions concerning internet infrastructure, having come "under scrutiny for under-investment in digital infrastructure." Universities develop their own digitization strategies, which tend to be adapted unevenly among the faculties.

support the acceleration of Open Access publishing, there clearly remain some barriers. For the course, Vivasvan Soni's chapter on "Energy" (three pages in total) was not available digitally at my university at the time, so the whole book had to be borrowed, transported, and scanned (and then returned) for us from another university.[14]

Most of the older canonical texts we used in class, such as *Moby Dick* or *Emma*, were accessible online. Students were given links to the full texts, while the excerpts discussed in the sessions were scanned from library editions. Distributing the scanned physical text allowed students and the instructor to literally be on the same page and provided additional standardized and qualified text material (e.g., editor's notes and afterwords) to enrich the reading and discussion. More recent texts were either made available as scans, or the students were asked to purchase them. All digital teaching material was provided by the university's own cloud-based service (e-campus).

When I reached out to the University of Bonn's Data Centre (*Hochschulrechenzentrum*, or HRZ) to ask whether the course's energy use could be estimated, I was told that "It is impossible to calculate the power consumption for a specific course with reasonable effort." However, the HRZ team provided a working model for illustrative purposes.[15] The e-campus uses 2,784 kWh when considering the storage requirement quota, 3,380 kWh when referring to its memory utilization rate, or 4,649 kWh when measuring the CPU utilization rate of the university's overall information technology (IT) services' energy usage for one semester. A suggested independent average value is 3,604 kWh, i.e., what a small wind farm with relatively moderate output produces.[16] Finally, assuming that all courses are equally energy-intensive, one seminar uses 1.67 kWh per semester—as much as a standard electric kettle on a busy day (in use for a total of 45 min.). As with any digital infrastructure, there is a certain dynamic to these measurements: the storage data (how many texts are stored in the cloud) is less important than the issue of user access and storage infrastructure.

The individual workload—another imprint of how energy, its connection to performance, and the measuring thereof structure our everyday academic life—amounted to a total of 82 hours for the seminar. Assuming that all students used an electronic de-

[14] Deutsche Forschungsgemeinschaft (DFG), "What Is DFG's Position Towards Open Access with Regard to Research Policy?" Strategy Paper (2018) and Position Paper (2022), https://www.dfg.de/en/research_funding/programmes/open_access (accessed June 20, 2024). For Germany, the Berlin Declaration from 2003 from the Federal Research Fund promotes this as a goal; Vivasvan Soni, "Energy," in *Fueling Culture: 101 Words for Energy and Environment*, edited by Imre Szeman, Patricia Yaeger, and Jennifer Wenzel (Fordham University Press, 2017), 132–35.

[15] These statistics are to be understood as a snapshot, as the energy usage is not constantly measured and the system is in a transitioning phase. All data accounts for the winter semester's period from October 2023 to February 2024.

[16] Compared for example to the Beleolico wind farm (Italy) whose average power rating was 3 MW in 2022 according to the *Wind Europe* report (p. 23). *WindEurope. Wind Energy in Europe: 2022 Statistics and the Outlook for 2023–2027 | WindEurope*. April 2, 2022. Accessed May 30, 2024.

vice with a standardized energy consumption, this would mean 4,1 kWh per student.[17] Since it is likely that not all students spent exactly this amount of time in front of their laptops, this figure should only be taken as an estimate. Other energy or resource intensive practices include the use of a presentation screen, room lighting, printouts, and transportation. However, these are less measurable as they intervened differently during each meeting. Overall, there is a difference between the energy intensity that is palpable and that which is measurable.

Teaching energy humanities in literary studies

One of the key takeaways from this brief journey through literary energy history is that transparency should be understood on multiple levels. Indeed, teaching energy humanities requires being transparent about the modalities and affordances of teaching itself. It means making history and society visible to show where and how energy has defined our present. It also means creating an atmosphere of honesty in the classroom and making it clear that energy use is both one of the driving factors of climate change and a crucial feature of everyday life, while keeping in mind the inequalities in energy consumption and distribution.

Teaching energy humanities in literary studies is a different experience than teaching other courses in literary studies, as the non-literary world is never excluded from the classroom. In my course, classroom discussions were engaging from the beginning, but the more students developed a critical perspective on energy, the more rewarding these conversations became; this trend was evident both in the complexity of the discussions toward the end of the semester and in the final assignments. When asked for a final opinion on the course, several students described how they felt their biography reflected current developments in energy history; they listed fiction they had read without "seeing the energy in it" and wrote about how energy appeared in other theoretical (con)texts they were reading about for other courses. Some students, however, simply wrote in the typical laconic manner that these kinds of surveys sometimes produce: "It was fun."

Thanks to Fabian Prante and the team of the HRZ Bonn.

[17] "Stromverbrauch von PC, Laptop & Tablet," *co2online*, https://www.co2online.de. Here 50 W/h is used as a benchmark for a standardized laptop.

The World of Energy and The Myth of Containerization

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By **Karl Emil Rosenbæk**

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In December 2023, 46 shipping containers fell overboard from a Maersk ship in the North Sea during harsh weather. Four of the containers were washed ashore on Jutland's west coast. The 42 other containers remain unfound.

Although 46 containers in the North Sea represents a fraction of the hundreds of containers lost at sea every year, the incident spurred commotion in the Danish public.[1] Looters rushed to the scene to procure washed up refrigerators, shoes, and more, while concerned citizens sought to clean the beach from this sudden flotsam. Between December 2023 and January 2024, nationwide newspapers reported some 50 times on the Maersk containers washing ashore.[] Coverage also appeared frequently on local news media outlets in Jutland, in the Danish Broadcasting Agency (DR) output, and in the tabloid media. This omnipresence might in fact not be all that surprising, given Denmark's low-lying location and comprehensive coastline. Still, this incident—the event itself, the media coverage, and the aftermath—is a microcosmic indication of the Global North's growing exposure to environmental damage wrought by the world-system of commodity capitalism based on resource extractivism.

The Maersk incident, I argue, is but one example of an enculturation of energy in its myriad forms. This is not simply because the container enterprise is known for its usage of bunker fuel—one of the heaviest and most contaminated fossil fuels in use—but also because containerization in itself must be characterized as a pivotal

[1] According to the latest figures from the World Shipping Council, 661 containers were lost at sea in 2022, which "represents less than one thousandth of 1% (0.00048%) of the 250 million packed and empty containers currently shipped each year." World Shipping Council, *Containers Lost at Sea – 2023 Update*,https://www.worldshipping.org

world-event in the history of fossil fuel distribution, elaborated energy markets, and global commodification.[2]

According to Laleh Khalili, "Maritime trade, logistics, and hydrocarbon transport are the clearest distillation of how global capitalism operates today."[3] Per her calculations, "Ninety per cent of the world's goods travel by ship. Crude oil, carried in tankers, constitutes nearly 30 per cent of all maritime cargo; almost 60 per cent of world trade in oil is transported by sea."[4] Our reliance on energy, however, does not stop with shipping. Everything from health care systems to waste management to climate change alleviation and adaptation require increasing amounts of energy. So too do the computing and increasingly artificial intelligence-based networks on which these realms rely. According to the World Economic Forum, "The computational power required for sustaining AI's rise is doubling roughly every 100 days."[5] What is more, the increasing demand for energy to support these developments takes a toll on valuable resources: from oil and natural gas deposits to critical minerals to the global basin of fresh water. The use and expansion of AI, for instance, "may be accountable for 4.2—6.6 billion cubic meters of water withdrawal in 2027, which is more than the total annual water withdrawal of 4—6 Denmark or half of the United Kingdom."[6] As such, the varied field of energy humanities insists that any critical analysis of a modern phenomenon or problematics must be conscious of the important role energy plays.

Fossil infrastructure has for the past two centuries increasingly defined modern ideations and sociocultural concepts: freedom, mobility, leisure, growth, "the good life," food and fashion trends, conservation, habitation, and so much more. Moreover, the ingrained existence of fossil energy supporting modern life also means that the turn to renewable energies requires the transformation of lifestyles. As Imre Szeman and Dominic Boyer attest,

The existing language of energy transition is most often defensive, insisting on changes in input in order to preserve global capitalism and its systems of property and profit. [...] This constitutes an enormous challenge and is one that we have barely begun to take up. What we need to do is, first, grasp the full intricacies of our imbrication with energy systems (and with fossil fuels in particular), and second, map out other ways of being, behaving, and belonging in relation to both old and new forms of energy. The task is nothing less than to reimagine modernity, and in the process to figure ourselves

[2] Craig Martin, *Shipping Container* (Bloomsbury, 2016).

[3] Laleh Khalili, *Sinews of War and Trade: Shipping and Capitalism in the Arabian Peninsula* (Verso, 2020), 3.

[4] Ibid., 1.

[5] Beena Ammanath, "How to Manage AI 's Energy Demand – Today, Tomorrow and in the Future," World Economic Forum, April 2024,https://www.weforum.org/agenda/2024/04/how-to-manage-ais-energy-demand-today-tomorrow-and-in-the-future/

[6] Pengfei Li et al., "Making AI Less 'Thirsty': Uncovering and Addressing the Secret Water Footprint of AI Models," *ArXiv* preprint, arXiv:2304.03271,https://arxiv.org/pdf/2304.03271

as different kinds of beings than the ones who have built a civilization on the promises, intensities, and fantasies of a particularly dirty, destructive form of energy.[7]

To transition away from fossil fuel energy entails a complete rewiring of our self-perception. To do this requires an understanding that modern Denmark (and the Global North as a whole) is founded on Cambodian brick kilns and Indonesian sweat shops.[8] To put it in other terms, fossil energy and the encompassing extractivist ideology (that is, the world-system of extractivist capitalism) is everywhere, but it expresses itself differently everywhere.

The recent return to Marxian world literature studies, promoted by Franco Moretti and the Warwick Research Collective in particular, works to disclose how this dialectical relation of different expressions within the capitalist world-system is registered in modern fiction. When containers return to the shores of Denmark—the home of the world's second largest container shipping company in the world—we Danes are suddenly exposed to the fossil-fueled marine infrastructure that makes the capitalist world go round. We saw a similarly sudden realization in 2021 when the Suez Canal was blocked for six days by the large container vessel *Ever Given,* which was operated by the Taiwanese firm Evergreen (in hindsight, the company's name rings of irony). Exposing the often-obscured reality of the global energy infrastructure is at the heart of energy humanities.

Taking the Trash Out...

As such, with the Danish container incident in mind, I will use the rest of this piece to present a recent work of literary fiction that represents what Hannah Freed-Thall has called the "cracks in a containerized world."[9] The work I will present may at first seem remote from the Danish context. That this, however, is not the case, is exactly the point I wish to make with regards to the aforementioned understanding that extractivist capitalism is everywhere but expresses itself through a variety of means. In other words, I wish to show how literature works to expose the frailty of the idea of containerization, of enclosing and compartmentalizing the effects and consequences of extractivism.

The 2011 novel *The Man with the Compound Eyes* by the Taiwanese writer Wu Ming-Yi illustrates with rare clarity the world-ecological consequences of global capitalism.[10]

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[7] Imre Szeman and Dominic Boyer, "Introduction: On the Energy Humanities," in *Energy Humanities: An Anthology*, edited by Imre Szeman and Dominic Boyer (Johns Hopkins University Press, 2017), 3.

[8] Laurie Parsons, *Carbon Colonialisms: How Rich Countries Export Climate Breakdown* (Manchester University Press, 2023).

[9] Hannah Freed-Thall, "Beaches and Ports," *Comparative Literature* 73, no. 2 (June 2021): 141,https://doi.org/10.1215/00104124-8874051

[10] For more on world-ecology, see Jason Moore, *Capitalism in the Web of Life: Ecology and the Accumulation of Capital* (Verso, 2015).

In Ming-Yi's novel, Atile'i, an indigenous boy from a sequestered Pacific Island called Wayo Wayo is, as the second son, destined to become a solemn offering to the Sea God. Turning fifteen, Atile'i is sent away from the island by his native tribe on his self-made "grass boat," or *talawaka*, to face his destiny in the hands of the vast ocean that they believe constitutes the outer rims of the world.[11] Out at sea, the boy's *talawaka* begins to take in water. Soon, he abandons it and begins to swim without any clear direction. Deprived of energy, he passes out only to wake up on an immense artificial island, "made not of mud but of a multi-hued mishmash of strange stuff, and there was a weird smell hanging in the air."[12] He lives on this mass of trash, this pacific plastic island, for weeks only to find the island is surrounded by dead sea turtles, whose stomachs are filled with small bits of plastic. Even as he avoids eating anything found in his local environs, he slowly begins to notice that "his body was changing: his gums often bled and his joints ached, too. He could not swim as smoothly as before. Sometimes he even felt dizzy."[13] It is clear to the reader that this floating pile of trash is polluting the seaways, killing the animal life, and harming the human body. Eventually, Atile'i's troublesome journey on this island comes to a halt as an oceanic storm sends it crashing onto the eastern shore of Taiwan.

As Kunyu Wang, Guidan Zhang, and Lucy Drummond have written in their analysis of the book, Taiwan "has undergone a rapid period of economic growth and industrialization, yet it grapples with the fallout of industrial pollution."[14] In *The Man with the Compound Eyes,* this development is emblematically shown in a scene about a tunnel drilling project that will save commuters around thirty minutes of travel time. At the quote above exposes, the attitude towards the environmental consequences of rampant economic development is bleak. As such, the trash island reaching the shore of Taiwan in the story, then, reads as a clear example of nature striking back. Concerning the tunnel project, Detlef, the engineer contracted to design the project, assesses "that the difficulties involved in digging the tunnel shouldn't be insuperable, but it might not be worth the time and money" as "the quartz-like Szeleng sandstone along the route [contained] so much quartz it was basically quartzite. It had a Mohs hardness of between 6 and 7, when steel was only 5!" And yet, the government officials go forward with the line that "the tunnel is feasible no matter what."[15]

As much as any other, this passage captures the primary message of this admittedly elaborate and polyvalent novel. The "no matter what"-attitude towards a doubtful enterprise of drilling a hole through a massive mountain in the name of miniscule gains seemingly without any regard for the toil, the energy use, the waste management, the

[11] Wu Ming-Yi, *The Man with the Compound Eyes* (Vintage Books, 2014), 13.

[12] Ibid., 31.

[13] Ibid., 126.

[14] Kunyu Wang, Guidan Zhang, and Lucy Drummond, "Island, Identity, and Trauma: The Three Ecologies of Wu Ming-Yi's *The Man with the Compound Eyes*," *Island Studies Journal* 20, vol. 1 (November 2023): 7,https://doi.org/10.24043/001c.89379

[15] Ibid., 201.

pollution hazard, the wildlife disturbances, or any other aspects related to the project embodies the modern enculturation of the growth paradigm perfectly. As such, the novel is also a succinct ecological parable of the impossibility of stepping outside of this ideology. Even the inhabitants on Wayo Wayo—completely unaware and insulated from this capitalist way of life—are not unaffected by the world-altering consequences of this paradigm. Not only does Atile'i get stranded on a plastic island, the Wayo Wayo-island is eventually "engulfed by [a] tsunami" caused by some unintelligible faraway attempt to geoengineer or seismically explore the deep sea.[16]

[T]his morning, a silent flotilla was monitoring some remote area of the great ocean and lining up like a firing squad. Each crewman stood at his post, gazing towards the horizon. Before long a beam of light leapt up into the sky, flew level for several thousand kilometres, then dove. Just getting up, the Wayo Wayoans thought a massive shooting star had crashed into the sea.

The beam of light plunged beneath the waves and kept boring its way down into an abyssal trench. Never seen before by man, the trench was home to bizarre creatures who could have come from outer space. Suddenly, every creature in the entire ocean heard a deafening sound, like no sound that had ever been heard before, as if some mighty being were departing. A great gash opened up deep in the trench, and a shock wave was transmitted towards the two ends, raising a tsunami of unprecedented power.[17]

Whatever the intent of the light beam—is it perhaps even a weapon testing of sorts?—the consequence is clear. Wayo Wayo is whipped out and "a week later, a pod of several hundred sperm whales would be discovered beached on the shores of Valparaíso, Chile, with grim eyes, cracked skin and crushed ribs."[18]

Reading *The Man with the Compound Eyes*, one cannot omit the hypocrisy of the Danish attention towards 46 contains washing ashore in Jutland. Indeed, Denmark continues to export up to 50 percent of its plastic waste (some 50,000 tons) yearly even though Danes are crucially aware that this waste ends up in Asian landfills and waterways.[19] There is in fact no outside. One way or the other, Ming-Yi's novel and the Maersk incident reveal that "the great ocean will dump back all the trash people dump in it."[20] As such, the floodings, the plastic islands, and the seabed desolation that currently transpire as a direct consequence of the fossil energy paradigm are no longer just examples of "cracks in a containerized world." Rather, the cracks are becoming wide open, and the world is talking under water at an enormous speed due to the containerized ignorance of the Global North.

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[16] Ibid., 200.

[17] Ibid., 298.

[18] Ibid., 299.

[19] Birgitte Dalgaard, "What Happens to Our Plastic Waste?" *University of Southern Denmark*,https://www.sdu.dk/en/om_sdu/fakulteterne/teknik/nyt_fra_det_tekniske_fakultet/hvad_sker_der_med_plastikaffald

[20] Wu, *The Man with the Compound Eyes*, 292.

Museums and the Challenge of Cultural Decarbonization

June 6, 2025

By **Hiroki Shin**

Hiroki Shin is Associate Professor in History of Energy and Environmental Humanities at the University of Birmingham, UK. His contributions to energy history and the museum sector include being co-investigator of the Material Cultures of Energy project, research fellow at the Science Museum, UK, and the recipient of the Smithsonian Institution's senior fellowship. Shin also serves on the editorial board for the new monograph series Critical Energy Studies from MIT Press.

Cultural institutions are now coming to terms with the uncomfortable truth that they are deeply embedded in the high-carbon civilization that has fueled the climate crisis. Not only does the creation, maintenance, and operation of culture involve constant energy use, but institutions exist in the distinctive economic system that thrives on the extensive use of resources and the accumulation of fossil capital. Culture's connection with the energy system goes much deeper, as cultural production is a crucial part of the value system that has co-evolved with the material world of the Anthropocene, a widely—though not officially by geologists—recognized geological epoch defined by the unprecedented destruction of the Earth's ecosystem by human activity. This overlap between culture and energy is the foundation of energy humanities, which critique how modern cultural production has conspired with, and sometimes resisted, an energetic world system.

The rise of energy humanities over the last decade or so has coincided with the intensifying need for humanistic intervention in societal decarbonization. As technical and market-based solutions have failed to arrest the global community's moribund march toward 2+ °C global warming, climate scientists, energy experts, and concerned citizens are searching for a whole-society climate change response. Cultural sectors are inspiring hope for an alternative energy future, which also means that cultural production is being closely scrutinized for its potential and shortcomings.

As an energy researcher who has been working closely with the museum sector, my main concern is identifying and enhancing the role of energy humanities in what I call cultural decarbonization in the museum. My formulation of this decarbonization

involves practical and intellectual challenges that can be distilled into three aspects. The first is the operational decarbonization of culture, as the current modes of cultural production, management, and appreciation (or, if you like, consumption) in museums usually entail carbon costs. The second aspect addresses the existential problem of museums within the current capitalist mode of cultural production, in which fossil capital retains material and political influence, causing organizational and ethical problems for museums. The third aspect is epistemological, as culture is enmeshed with the energy-intensive societal values of our age. This article outlines how these three levels of cultural decarbonization have manifested in recent years and briefly discusses relevant historical roots. Despite some progress in decarbonizing their operations, European museums still grapple with the existential and epistemological levels of decarbonization: the fundamental cultural values they present remain largely unchanged. Energy humanities, as a critical lens for examining the humanistic nature of our energy civilization, can reshape our public culture and guide museums through this transformative process.[1]

Decarbonizing cultural operations: cultural sustainability and beyond

In the 2000s, cultural sustainability emerged as a key concept that urged cultural institutions to contribute to sustainability and affirmed their greater role in society and the economy. As managers, practitioners, and experts within the culture sector reevaluated their practices, they considered their resource use—especially their energy consumption—as a fundamental part of their transition toward greener practices. This change was driven by an enhanced awareness of the sector's potential impact on the environment and a desire to mitigate harm, which reflected a broader societal shift toward sustainability. This focus on cultural sustainability was, however, accompanied by cultural institutions' reluctance to engage with the climate change debate. This reluctance has been attributed to the issue's highly politicized nature in the 1990s and early 2000s, when highlighting global warming in public cultural sites was seen as inviting divisive debates. Pioneering climate change advocates in the museum sector emerged as a relatively small group of concerned practitioners.[2] Since then, advocates of climate-informed culture have hoped for museums and galleries to become leading

[1] Dominic Boyer and Imre Szeman, "Breaking the Impasse: The Rise of Energy Humanities," *University Affairs* 40, no. 3 (2014): 40–44.

[2] Brenda Berck, "Museums: Rethinking the Boundaries," *Museum International* 44, no. 2 (1992): 69–72; Robert R. Janes, *Museums in a Troubled World: Renewal, Irrelevance or Collapse?* (London: Routledge, 2009); Jeffrey K. Stine, "Placing Environmental History on Display," *Environmental History* 7, no. 4 (2002): 566–88.

forums for climate action—a hope that is yet to be fulfilled, though cultural venues have become sites of climate debates and events.[3]

Addressing the carbon emissions from the daily operations of cultural issues has been accelerated by the convergence of sustainability and climate issues. The Arts Council England introduced environmental reporting as a funding requirement in 2012. Between 2012 and 2015, over 700 cultural organizations in the UK, including museums, theaters, and music events, reported on their environmental performances, primarily their energy and water usage; they reported reducing energy-related CO_2 emissions by 12,673 tons.[4] The 2015 Paris Agreement further incentivized the cultural sector to intensify these efforts. As a result, decarbonization strategies have expanded beyond more obvious measures such as constructing environmentally friendly buildings, installing solar panels on rooftops, and planting trees on properties owned by cultural institutions. Museums and other cultural venues now consider carbon emissions within their supply chains and the environmental impacts of visitor travel.

It is important to note, however, that carbon emissions in the culture sector are minuscule compared to other energy intensive sectors such as energy generation, industrial production, and transportation. This low emission level is not intended to belittle the culture sector's decarbonization, as the full potential of cultural decarbonization is far greater than operational decarbonization, nor should a reduction in carbon emissions justify maintaining the traditional mode of cultural production. In recent years, the social responsibility of cultural institutions such as museums and galleries has extended beyond their carbon footprints, and their roles in the present economic system—especially regarding their relations with the fossil fuel industry—have sparked intense debate.

Can culture be carbon free?

In the twenty-first century, cultural institutions in most countries are deeply embedded in the capitalistic mode of cultural production and operation. Symbolically and financially, museums and galleries are often associated with the capitalistic value system that applies the logic of monetary equivalents (i.e., exchange value) to all human creative activities. Eco-activists' attacks on high-profile artworks are, according to Sally Hickson, acts that challenge the general public to rethink what we really value by subjecting valued/invaluable pieces of artwork to physical harm.[5] Some protests expose the ties between cultural institutions and the oil industry, usually through the latter's investment in the culture sector.

[3] Fiona Cameron and Brett Neilson, *Climate Change and Museum Futures* (Routledge, 2015).

[4] Julie's Bicycle, *Sustaining Great Art: Environmental Report, 2012–2015* (Arts Council England, 2015).

[5] Sally Hickson, "Eco-Activist Attacks on Museum Artwork Ask Us to Figure out What We Value," *The Conversation*, last modified November 3, 2022, theconversation.com

The oil industry's cultural sponsorship has caused heated debate, which depletes public trust in cultural institutions. In the UK, activists and concerned citizens (including groups of school teachers) have pressured public culture institutions to sever ties with the fossil fuel industry. The high-profile cases of the Tate Galleries, which ended its partnership with British Petroleum (BP) in 2017, and the British Museum, which, despite strong criticism, has continued its association with BP, have adorned the media. As of March 2024, there is controversy involving the Science Museum, London, which received funding from the Indian fossil giant Adani to create a new energy gallery. Here, a personal disclaimer is necessary, as this author (a former research fellow at the museum) has had a minor role in the development of the new gallery.[6]

The direct roots of many museums' connections with industrial sponsors are found in the privatization of public culture and the subsequent lack of public investment since the 1980s, which amplified the cultural institutions' financial dependence on private sponsors. Museums struggle to reconcile their social responsibility with their educational mission when their current business model makes it nearly impossible to find funding for energy-related programs from sources outside the energy industry. The ethical problem of receiving petro-money seems self-evident, but the oft-evoked analogy between the tobacco industry and the fossil fuel industry is not fully warranted.[7] While the rejection of tobacco funding has led to the desired end of reducing the visibility of tobacco products, a similar rejection of funding from the energy sector, in which fossil fuel still has overwhelming share, may lead to the *undesired* consequence of reducing the visibility of energy issues in public cultural sites. This is especially the case as the emerging renewable energy industry is generally organized around relatively small corporations that will not become cultural benefactors any time soon. There is an urgent need to find a new model of funding energy- and climate-related public exhibitions, as the issue of fossil industry sponsorship is damaging the credibility of scientific and technical knowledge presented in museums.

It would be a mistake to assume that the disappearance of oil companies' cultural patronage would completely decarbonize culture, as there is an existential connection between the modern exhibition culture and the modern energy system. The exhibition as a medium of culture has shaped the narrative of modern energy. Within the UK, there has been an intimate relationship between exhibitions, culture, and the development of modern energy since the 1851 Great Exhibition. As highlighted by Alice Bell, the central theme of this archetype of modern exhibition was the depiction of a

[6] The author discussed the exhibition theme with the curatorial team during the gallery's development stage and commented on the section about children's ideas on energy saving. The author received no remuneration whatsoever.

[7] Derrick Chong, "Tate and BP – Oil and Gas as the New Tobacco?: Arts Sponsorship, Branding, and Marketing," in *The International Handbooks of Museum Studies* (Wiley & Sons, 2015), 179–201; George Monbiot, "Why Is the Science Museum Still Being Contaminated by Shell's Dirty Money?," *The Guardian*, last modified April 21, 2021, www.theguardian.com/commentisfree/2021/apr/21/science-museum-shell-money-exhibition-climate.

new civilization based on the burning of coal, which was embodied in the displays of the steam engine, a diverse range of machine-produced industrial products, and fuel samples.[8] Energy historians have documented how exhibitions publicly showcased the potential of modern energy, from electrical illumination to nuclear science, in tangible forms. Many major museums in the UK and continental Europe emerged from the mineral energy regime. In this longitudinal historical context, it should also be remembered that the early exhibitions on what we now recognize as environmental topics emerged from the coal economy. The first public exhibition on air pollution, the Smoke Abatement Exhibition of 1881–82, did not question the use of coal, as its main aim was to reduce pollution by promoting a more efficient use of coal, with an increased use of "smokeless" anthracite and gas appliances (when manufactured gas was generated by burning coal).[9][10]

The origins of some of Europe's major science museums are directly related to the coal economy. For instance, the Deutsches Museum, conceived by electrical engineer Oskar von Miller and opened in 1906, was built on Coal Island (Kohleninsel); thus, the museum constitutes a physical legacy of the coal economy. Some of the original collections of the Science Museum in London, including steam locomotives, can be traced back to the 1851 Great Exhibition. Across Europe, steam engines and other coal-related displays such as model coal tunnels were key attractions around which science and technology museums were organized—and coal technology continues to dominate the stories of European industrialization told at public museums. Unlike in the US, there are only a few oil museums in Europe, with a few exceptions including the comparatively new Stavanger Oil Museum in Norway (established in 1999).

Exhibitions on the theme of energy have developed over more than a century in a world dominated by fossil fuel, and this historical context has shaped a distinctive form of cultural Exhibitions on the theme of energy have developed over more than a century in a world dominated by fossil fuel, and this historical context has shaped a distinctive form of cultural articulation that privileges the extensive use of mineral energy, particularly coal, oil, and their associated technology. This firmly embedded cultural value has only recently been challenged as the climate debate has entered museum exhibitions. American museums pioneered with exhibitions such as the *Global Warming New Energy Future* exhibition (2008–2009) at the American Museum of Natural History. In Europe, the Deutsches Museum's *Welcome to the Anthropocene* (2014–2016) and *energie.wenden* (2017) exhibitions and the Science Museum's Atmosphere Gallery (2012) heralded the new era of energy exhibition, though museums have been criticized for not being unequivocal about anthropogenic climate change.

[8] Alice Bell, *Our Biggest Experiment: A History of the Climate Crisis* (Bloomsbury Sigma, 2021).

[9] John Ranlett, "The Smoke Abatement Exhibition of 1881," *History Today* 31 (1981): 10–13.

[10] Lise Camilla Ruud and Erik Thorstensen, "'We Must All Be Ready for Major Changes': Visiting Climate for Change at the Norwegian Petroleum Museum," *Journal of Educational Media, Memory, and Society* 14, no. 1 (March 2022): 55–75, doi.org. On the exhibition, see /www.tekniskmuseum.no/en/exhibition/energy.

With a growing consensus on global warming since the 2010s, discussing climate change in museums is no longer uncommon. Norwegian museums have been noted for their self-reflective practice in recent years, the latest example being the Teknisk Museum's new exhibition *Energy in the Time of Climate Crisis*.10 However, the increasingly dominant climate change narrative conflicts with the conventional energy narrative that celebrates the fossil fuel economy as a landmark achievement in human history, which is evident in permanent galleries featuring steam engines, internal combustion engines, automobiles, planes, and space rockets. These contradictory stories can be confusing and frustrating for museum visitors who are mostly well-informed of the ongoing climate discussion. It is therefore imperative for museums to find a new narrative that encompasses the positive and negative aspects of our energy heritage.

Technological optimism is also deeply embedded in exhibitions. Science displays have been dominated by heroic stories of human ingenuity in what has already been invented, current experiments, and future realities. While hope about the future is important, the optimistic message of future fixes might appear to justify business as usual—a message the oil industry strives to secure. A public exchange between George Monbiot and Bob Ward in the *Guardian* in 2021 concerned a temporary exhibition on carbon capture technology, *Our Future Planet* at the Science Museum in London (2021–2022). Monbiot, journalist and climate activist, argued that two of the exhibition's major benefactors, BP and Equinor (a Norwegian oil company), exaggerated the merits of the technology and the oil industry's commitment to preventing global warming.[11] Ward, policy and communications director at the Grantham Research Institute on Climate Change and Environment, defended the exhibition as a valuable contribution to the communication of climate change issues and technological options for the benefit of the general public.[12] The debate has shifted from the ethics of accepting fossil fuel sponsorship to the broader issue of public knowledge about climate and energy. While this author is not convinced by Monbiot's simplistic argument that having specific sponsors necessarily renders the exhibition untrustworthy, Ward's technological optimism seems to have very limited appeal when the world desperately needs immediate responses beyond technical fixes to the rapidly deteriorating world climate.

Decarbonizing museums involves creating new climate-informed energy narratives, revising the existing progressive narrative, and exploring how this epistemological cultural decarbonization would realize the full potential of culture to encourage societal decarbonization and a renewable energy transition. In this process, museums can fully engage with the public not only by informing them but also by encouraging a debate, including one about their own displays.

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[11] Monbiot, "Why Is the Science Museum Still Being Contaminated by Shell's Dirty Money?"

[12] Bob Ward, "The Science Museum's Carbon Capture Exhibition Is Not 'Greenwash,'" *The Guardian*, last modified April 22, 2021, www.theguardian.com/environment/2021/apr/22/the-science-museum-carbon-capture-exhibition-is-not-greenwash.

Driving cultural decarbonization forward

As Stephanie LeMenager has remarked, "Every museum makes a statement about the future, about what kind of past will sustain it."[13] Indeed, museums constitute our energy futures through distinctively cultural experiences—by compelling us to reflect upon past energy choices that shaped our present climate predicament and to reimagine our energy future and move toward it. In this cultural space for speculation, despair, and hope, energy humanists have a rightful place. Museums, as cultural media, should not be viewed as innocuous, neutral sites that simply serve as platforms for knowledge transfer. Like any other cultural production, museums are dynamic sites where knowledge is negotiated, contested, and questioned.

In this space for contemplation and action, scholars are demanding a role greater than they have traditionally been allocated by making museums and exhibitions active sites of academic and political intervention. One notable example is the Museum of Carbon Ruins, a project initiated by researchers at Lund University, Sweden. The exhibit is set in 2053, when the global community has supposedly achieved net zero emissions of carbon dioxide. This exhibition encourages speculation about the energy future through displays including a jar of oil, a frequent flyer card, plastic products, and a hamburger.[14] Collaboration with, rather than condemnation of, cultural practitioners seems to be the sensible way forward, as another collaborative project, Reimagining Museums for Climate Action, which coincided with the COP26 in Glasgow in 2020, demonstrated. The exhibition showcased how academic–practitioner co-curation can stimulate new ideas among experts while inspiring the public.[15] Curiously and regrettably, energy-themed and science museums have often been excluded from these new initiatives, which, I argue, is partly due to the insufficient understanding of the unique and challenging natures and histories of those museums—a knowledge gap this article hopes to highlight.

Cultural decarbonization in museums is not just about refusing funding from oil companies. No less important is critiquing the high-carbon civilization and its accompanying value system. Energy humanities can uniquely contribute to decarbonizing our public culture, a key site where future visions are shaped, deep-seated assumptions are questioned, and, among all else, negative legacies from our carbon-intensive past are scrutinized and debated. In doing so, energy humanities become a form of critical *praxis*, which has the capacity to destabilize the entrenched energy-intense social

[13] Stephanie LeMenager, *Living Oil: Petroleum Culture in the American Century* (Oxford University Press, 2014), 142.

[14] www.climaginaries.org/carbon-ruins. See also Paul Graham Raven and Johannes Stripple, "Touring the Carbon Ruins: Towards an Ethics of Speculative Decarbonisation," *Global Discourse* 11, nos. 1–2 (2021): 221–40. The project is discussed in Graeme Macdonald, Terra Schwerin Rowe and Hiroki Shin, "Museums of the Future," Volatile Trajectories (podcast), Nov 24, 2022, accessed Mar 28, 2024, www.youtube.com/watch?v=NUphrqAXx4w

[15] Rodney Harrison and Colin Sterling, *Reimagining Museums for Climate Action* (Museums for Climate Action, 2021).

values. Cultural institutions need this new alliance with energy humanities to reshape their values and roles to navigate our age of decarbonization ethically and critically.

** Preserving Oil: A Conversation with Educators at the Norwegian Petroleum Museum and Oil Museum of Canada

June 6, 2025

By **Camille-Mary Sharp**, **Julia Stangeland** & **Christina Sydorko**

Camille-Mary Sharp (Western U), Julia Stangeland (Norwegian Petroleum Museum), and Christina Sydorko (Oil Museum of Canada) each bring expertise in museum education, history, and energy. Their work spans museum activism, petroleum history, and resource extraction, with projects ranging from oil sponsorship critique to media memory studies and award-winning educational programming. Together, they examine the past and present of energy institutions through critical, public-facing scholarship.

Faced with the contradiction of heritage preservation in an age of ecological collapse, museums around the globe have begun to reckon with their responsibility towards climate mitigation. Often ignored in these discussions are oil museums, understudied cultural attractions where museum workers are tasked with researching, interpreting, and exhibiting the artifacts and histories of an energy industry in transition. This interview, conducted by Camille-Mary Sharp virtually in April 2024, brings into conversation two educators from distinct institutions: the Norwegian Petroleum Museum (Stavanger, Norway) and the Oil Museum of Canada (Oil Springs, Canada). Working ocean, seas, and lakes apart, Julia Stangeland and Christina Sydorko nevertheless find common ground—both raised on farms and trained as teachers, they now channel their passion and expertise towards critical energy literacy for current and future generations. This discussion reflects the interviewees' individual views and is not representative of their respective institutions.

Camille-Mary Sharp (CMS): You both work in "oil museums"—the Norwegian Petroleum Museum (NPM) and the Oil Museum of Canada (OMC). Despite their similar focus, these institutions differ significantly in their size, history, and place. How would you describe your respective museums?

Christina Sydorko (CS): I work for the Oil Museum of Canada (OMC), a national historic site that is owned and operated by the County of Lambton in southwestern Ontario. It is a small museum—under 500m^2—sitting on ten acres of rural land in the village of Oil Springs, about three hours east of Toronto. We employ two full-time staff and two part-time staff, and one or two students join us during the summer school break (which is peak time for our visitors).

The OMC was conceived in 1958 as a centennial project celebrating the first commercial oil well in North America, which was hand dug in 1858. The museum opened in 1960 and was recently completely overhauled for its 60$^{\text{th}}$ anniversary in 2020. It sits

in Ontario's first industrial heritage district and is surrounded by the still-operating oil fields of Fairbank Oil, which have been operating using 1860s technology.

Figure 1. The Oil Museum of Canada, Oil Springs ON, Canada (photo courtesy of the Oil Museum of Canada).

Our museum focuses on the history of oil's commercialization in the 1800s, on how Indigenous populations in North America utilized oil generations before European colonization, and on the colonial expansion and diaspora of Canadian extractive technologies—for example, looking at how oil drillers from Oil Springs, who started harvesting oil in 1858, spread that technology across 87 different countries by opening international oil fields. They went to Germany, to Poland; they went all over the world. But we are a community museum first and foremost, so we primarily focus on the local petroleum industry. Our task is to study the technical innovation of the petroleum industry in Canada, focusing on the local and on how it impacts the global.

Julia Stangeland (JS): I work at the Norwegian Petroleum Museum (NPM) in Stavanger, the oil capital of Norway. The museum (figure 2) turned 25 years old in 2024. It was established in 1999, but the idea for it came as early as 1974. We tell the history of the region of Stavanger and its oil industry, but we also show how the striking of oil has affected the rest of Norway. The history of oil in Norway is shorter than elsewhere—we did not strike oil until 1969, and all of our oil extraction happens offshore. It is the great difference between Norway and other places. Christina, in Canada, do you only have oil on land?

Figure 2. The Norwegian Petroleum Museum, Stavanger, Norway (photo courtesy of the Norwegian Petroleum Museum).

CS: Outside the museum building, you can actually step in oil. It comes up through the grass. We have gum beds. Gum beds are semi-fluid bitumen deposits comprised of both oil and clay soil particles. The bitumen is a black, sticky, and semi-solid form of petroleum that seeps to the surface (figure 3). People often ask us, "How was oil discovered?": you can smell it, you can step in it. It naturally oozes out of the ground. But Canadian oil production more generally includes both onshore and offshore operations.

Figure 3. Gum beds at the Oil Museum of Canada (photo courtesy of Christina Sydorko).

JS: In Norway, all our oil is extracted offshore. The North Sea was the first area that was opened for oil production. Ekofisk, the first Norwegian oilfield, is on the border of the Danish continental shelf. Later, the Norwegian Sea (north of the 62nd parallel) was opened for oil production as well. Today, we also have production further north, the northernmost field being the gas field Snøhvit (Snow White). Certain maritime areas in the northern parts of Norway are closed for petroleum production due to fishing, climate considerations, or both.

Stavanger is still called the capital of oil because many oil companies that first came to Norway established their offices and bases here. After that time, our parliament (Stortinget) decided that both our state-owned oil company (Equinor, formerly known

as Statoil) and the Norwegian Petroleum Directorate should also be based in Stavanger, further anchoring the city as the oil capital.

While the NMP is a national museum, the subject of oil has a different significance for people across Norway. For example, oil is mostly abstract for people in Oslo, for whom the drop in the price of oil in 2014 was not very obvious. In Stavanger, however, I heard about people losing their jobs in the oil industry or being temporarily laid off. The decrease in oil prices also affected secondary and tertiary jobs in Stavanger. When people cut down on expenses and reduced how much they traveled outside the region for instance, fewer employees were needed at travel agencies. The oil industry really works like a motor in the region. When students visit the museum and we ask them if they know anyone working for an oil company or on an offshore platform, many of them say yes. Indeed, chances are that they know someone related to this industry—a parent, grandparent, uncle...mostly men. Of course, some women work offshore, but it is less common.

CS: In this sense, my community is similar: one in four people work in petroleum or petrochemicals, because the industry holds this generational wealth of technology and has been operating here since the 1850s. Before there was a Canada, there was an oil industry. Today, we have 62 petrochemical companies employing people in our community—between 5,000 and 10,000 people. And those represent direct employment only; they do not account for people engaged in secondary or tertiary employment, such as engineers, who work for firms that outsource them to various oil companies like Shell, Suncor, Cenovus, etc.

CMS: Let us speak about what your work entails and what led you to a career in museum education.

JS: I studied to become a teacher in history and in Norwegian. I wrote my history thesis on the impacts of the Second World War in Norway, specifically Finnmark and Nord-Troms. When I was finishing my education, a job opened up at a museum in Hammerfest, which aligned with my thesis research. I realized it was the job for me, because when I was a student I felt more at home in the department of history than the teaching department. Sometimes, I feel like I am two people—the teacher and the historian—and at the museum, I feel like I can be both.

But Hammerfest is quite far north, so I did not want to stay there forever. Eventually, after writing what felt like a million job applications, I was hired at the NPM and moved home. I have now worked here for five years. The museum in Hammerfest was much smaller, which led me to be like a "potato" at work, as we say in Norwegian—doing a bit of everything. I have missed that dimension. Here, we have distinct departments for history, research, student education, guided tours, etc. Nevertheless, I have elbowed my way into other departments. I still teach, and I also do a bit of research, which keeps me quite busy. Aside from teaching and researching, I also plan and do some administrative work.

CS: Similarly, I am trained as a history and geography teacher. I spent fifteen years teaching high school history, geography, and family studies (the study of nutrition,

parenting, family budgeting, and life skills). As a young teacher, I also had a part-time job in the archives and libraries of cultural services in Lambton County. Once I got in, they could not get rid of me—I loved it. Eventually, it became full-time, permanent work. I made it my mission to redo the entire educational curriculum for the museum. I designed all of our educational programs. Because we are a small museum, we also do outreach, public speaking, and research. We are closed on Mondays and Tuesdays, so that is when I can go back to the archives or to interviewing people who worked in the oil industry, conducting oral histories and incorporating all of that data into our educational programs and exhibits. I also designed our exhibition touchscreens. I have thus had to learn a lot, for example how to code. It has been difficult. Coding is hard!

CMS: Oil museums bring together the critical themes of industry, technology, social history, and the natural environment. As museum educators, how do you connect these threads and inspire visitor learning, especially when it comes to sustainability and the environment?

CS: As a teacher licensed in Ontario, I must look at the curriculum outlined by the province. There is a legal framework for what we teach in Canadian schools; I focus on that framework, specifically on technology or environmental relations such as air and water quality. In reality, almost all students think learning about oil is boring. It represents their parents' work, it smells...so we need to make the topic of resource development tangible. This approach is not used in any of their textbooks or in the curriculum, so we try to relate oil at a community level, at a micro-level, at the level of the individual. For example, we ask, "How does oil development impact you personally?" The key to these individual stories is that oil affects the air we breathe, the water we drink. Since we live in a community where oil was first harvested on a commercial scale, we have lived with the detrimental effects of petroleum pollution, with higher rates of cancer and lung infection. At the museum, we aim at going beyond these statistics, as we also want to inspire natural curiosity in our visitors and engage them in conversation. Rather than throwing at kids a pile of facts that will make them fall asleep, we challenge them to think constructively and creatively about how oil impacts them personally. Oil is esoteric, but it also impacts people personally; for example, how different would the life of students be if their parents did not work for this or that oil company?

In fact, almost everyone in this community knows someone who works in the oil industry. We ask students other key questions such as, "Can you live or function without petroleum-based products?" What most people do not realize is that we live in a petroleum society. Indeed, the material culture of the average Canadian is petroleum-based. Petroleum is in our shampoos, toothbrushes, makeup...clothing, too, is made of synthetic fibers like polyester, spandex, or Lycra. We often talk about how people lived in the Stone Age, the Bronze Age, or the Iron Age, and about how we are now firmly entrenched in the petrochemical age. We want students to understand how petroleum fits in their lives and how they use petroleum products—whether disposal or reusable. We also challenge them to think of ways they can reduce, reuse, and rethink their

spending and travel habits. We need to challenge society's thoughts about oil and the environment.

We also expand on simple topics such as geology, asking questions about what oil is, how we extract oil from the ground, how the Earth produces oil, and what tools and science of extraction are used. We also think of the future of this industry. We do not deny climate change—it is very real. For example, we ask visitors how they think green technologies might impact the climate and how we can make the shift from oil to these new technologies. Much of our focus is on science, technology, engineering and mathematics (STEM), literacy, and history. How can we help promote creative thinking? It is more about conversations than opinions.

JS: The NPM does not deny climate change either, and that is a good thing. Here, we have a "menu" of various topics teachers can choose from when they visit with their classes. For example, if they choose "Climate for Change," which is the name of one of our exhibitions, we will talk with them about climate. If they choose a program called "In the Footprints of Oil," we will primarily talk about history. All of these topics are designed for high school students, but we receive mostly ninth graders, who are about 14 to 15 years old. We have a partnership with the city, through which all students from Stavanger eventually come to us, which represents approximately 63 classes, or 1,500 students. We host them in a classroom we call the Energy Room, where they engage in practical tasks and participate in a competition with multiple-choice questions. The class with the highest score wins a "Day of Fun" with us when they enter tenth grade. The Energy Room, of course, features a great amount of content about energy. We talk to students about how electricity is created and why we globally use so much coal, oil, and gas. In Norway, it is quite ironic that more than 90% of our electricity is actually generated through hydropower. Moreover, the oil and gas platform also need power. Most of them create their own power using gas turbines, but some use hydropower produced on land in Norway. The power is transported by cables on the seabed. Other platforms get their power from offshore wind turbines. Because Norway has agreed to reduce CO_2 emissions, some of the political parties have looked to the oil platforms for reductions. In other words, they want more of them to use "cleaner" energy. That means more cables transporting hydropower from land to the platforms. Unfortunately, electricity from hydro power is not unlimited.

We also discuss with students the severe downsides of using coal, oil, and gas. We divide classes into five groups, each of which makes a film on a different topic: coal, hydropower, wind, oil and gas, and atomic energy. Interestingly, some students do get engaged in the process. Like Christina said, talk should be limited, otherwise students fall asleep. We used to have a history class for older students, but they struggled to stay engaged. So, we regrouped and now we get them to do research themselves.

CS: At the OMC, we like to take people outside. We are located in the middle of an oil field, so we make visits experiential. Visitors can touch the oil coming up through the grass. They can smell it and see the pumpjacks. We service students from grades 4 to 12. But unlike the NPM in Stavanger, our museum is out in the middle of nowhere,

so it is challenging to bring students here. Funding is not available for transporting schools to the museum. They have to fund their own transportation.

JS: But while you can go outside and touch the oil, we cannot. Many of the kids who come to our museum have never seen an offshore platform, because many of those students are stationary. In the 1970s and 1980s, platforms were being built around and outside of Stavanger, so the technology and the industry were much more visible. Nowadays, some platforms or rigs come into land only to be serviced, and in fact sometimes we see ships passing by that are connected to the oil industry, but otherwise the industry remains quite abstract, even for those whose parents work on a platform or rig. Many of these kids have never been to work with their parents; unlike me, because my dad was a farmer and I essentially lived at his workplace.

CS: The same is true for me.

JS: This constitutes a great difference between the experience of the children we receive and our own, because we knew exactly what our parents were doing at work. But hopefully, when students visit our museum, they return home and tell their parents, "I went to the Petroleum Museum—which platform do you work on? Maybe I saw a model of it."

Another way we engage students is with a plastic box we fill with various items: socks, a rug, a shoe, some plastic wire, a gift card (with no money on it, unfortunately). The kids' task is to figure out which items are made of oil, and which are not. My favorite items are two socks, which I knitted myself. They look exactly the same, but one is made of 100% wool and the other is 80% wool and 20% nylon. Often, the kids struggle to find how the socks are different. And I tell them, "Sorry, but trying to fool ninth-graders is one of my life's small amusements."

CS: We offer the same activity. We include a pop can, lipstick, wine corks (from bottles we had at a party), pencils with erasers, and ChapStick. We call it the "Discovery Bag." It lives in my desk. Even pop cans—aluminum cans—all have plastic liners, which most people do not realize.

CMS: In the chapter "Breathing Life into Learning: Ecocultural Pedagogy and the Inside-Out Classroom" (Milstein et al., 2017), the authors sketch a pedagogical approach that intentionally blurs the boundaries between classroom and outside world, or, in our case, between museum and outside world. We have talked a lot about your approaches to teaching schoolchildren, but what do you think of these approaches when it comes to adult visitors? How do strategies in museum education differ between youth and adults?

CS: The OMC seeks to engage its audience beyond its museum walls by going out into the community to deliver programming to schools, adult-community groups, and seniors. We do this by delivering research-based lectures about history and the legacy of petroleum within the community. What is really nice about these lecture series is that, as people begin to feel comfortable, they open up and share their lived experiences and stories. Examples of these discussions include retired petrochemical workers discussing changes to workplace safety through unionization or new training programs and the

introduction of PPE (personal protective equipment) to prevent workplace illness or injury. We also discuss with adult museum visitors the connection between plastic or synthetic fibers in our clothing that are made from petroleum products, as many people do not always make that link.

While our student-based educational programs use pedagogical scaffolding to help students understand and analyze complex concepts such as energy infrastructure and consumption as related to economics and the environment, our adult programs can rely on lived experiences to start discussions on these topics and challenge ideas. The Oil Museum of Canada is a safe non-judgmental space to explore ideas around fossil fuels and aid in the formulation of such ideas through conversation—this is the goal of our outreach.

JS: Freely translated from our museum's vision is "knowledge and experiences that create curiosity and insight". Curiosity is an important clue here, I think. Our goal should be to tickle the curiosity of both students and adults to want to learn more—much more than what can be said in short texts in an exhibition. Whether visitors get additional information in books bought in the museum shop or use our website, the information they seek differs from person to person. Some visitors might be content after the visit and will not crave more information. It is important to remember that museum visitors have very different backgrounds. Some of them work in the oil industry and know it well. Some are local, some are Norwegian tourists, and some are foreigners. No matter the reasons people come and regardless of their background, we think it is important to offer exhibitions that are understandable and offer a mix of texts, objects, movies, sound, lighting, and activities. Activities are especially important. To be able to do something is a great way to learn.

CMS: Are there challenges to bridging industrial history and heritage with the more contemporary stakes about energy in which visitors might be interested?

JS: As Christina described is done at the OMC, we also use the official curriculum when planning our programs at the NPM. However, oil is not an explicit part of the curriculum anymore. It has largely been replaced by the environment and Sustainable Development Goals (SDGs). Those topics are important, of course, but it is also important to understand why we use a lot of oil, gas, and coal worldwide. More than 80 percent of our energy comes from these non-renewable resources. When you learn that, you can better understand that you cannot just quit using them overnight. You need to phase them out; if not, you risk a major energy crisis. At the same time, it is important to ask and to answer the question: Why do we use so much oil, gas, and coal when we know that these are nonrenewable and that burning them leads to CO_2 emissions?

Norway has a Government Pension Fund Global (Norges Bank Investment Management, n.d.)—an "oil fund" in which approximately 80% of what companies earn producing oil and gas is placed. These are taxes that oil companies pay to the government, because the government decided that the oil Norway produces should belong to the people rather than the oil companies. The fund currently holds over US$1.62

trillion in assets— a great sum of money. We produce about two million barrels of oil each day in Norway, but we do not use much of it ourselves (we use electricity for almost everything, from heating to cooking). Therefore, we are a large exporter of oil—25% of the gas used in all of Europe comes from Norway.

Countries that import oil and gas want prices to be as low as possible. But in Norway, it is when oil prices are high that the media and public narratives are much more positive. Of course, the students who visit us might think that striking oil is good for all countries, but we know that it can lead to both civil wars and wars between countries. We are lucky that Norway has strong relationships with Denmark and the UK, given their proximity to our oil and gas fields. So, there are many hypotheticals and angles we can talk about with students, if they are listening. But of course, we have to let them explore these topics themselves, engage them, and hope we pique their curiosity.

CS: The OMC is very close to the U.S. border, and we live in a highly polarized society, where topics of oil are viewed in very one-sided ways. At the museum, we try to explain how oil has developed and evolved, how it impacts everyday life, and what the environmental impacts of oil dependence are. In Sarnia-Lambton County, this dependence is very apparent. People can see the refineries and the oil rigs, so oil is highly visible. People can also smell it, touch it, and taste it.

Because oil is so politically divisive in Canadian and American societies, we tend not to say if oil is good or bad; our job is to tell the history of oil on a local scale. We simply provide facts and encourage visitors to make their own opinion. We also do not shy away from topics like the renewable energy transition. Our exhibitions and programs look both towards the future and towards history, for example through a case study of what an oil spill looks like in this community. We also use many older case studies from the 1860s and 1870s.

In some ways, Canada is a lot like Norway; we are resource net exporters, whether that is in lumber, mining, or oil. But different parts of Canada have different types of oil production: in the province of Alberta, there are large oil-sands deposits, which tend to produce heavy oil, whereas southwestern Ontario is a very small oil-producing area, but one of North America's largest petrochemical manufacturing area. We have had to live with the consequences of not understanding that "dilution is not the solution". Until the 1970s, the strategy was to dilute oil to lower concentrations in the environment—not realizing that chemicals can bio-accumulate there with long-term consequences.

At the museum, then, we talk about how to mitigate damage in our modern world and how the industry is shifting and implementing methods of carbon sequestration (for a good explanation of the concept, CLEAR Center 2019) or putting scrubbers on refineries. While we also try to challenge traditional narratives of extraction, we need to do it in a careful way, since many energy companies operate in our community. In many cases, because oil fields predate Confederation (the 1867 formation of the Dominion of Canada), companies "own" the resource in its entirety. The oil fields were "grandfathered in" during Confederation, in the 1850s context when there were few

rules and regulations. It was not until the mid-twentieth century that the industry became globally regulated to a much higher degree. Therefore, northern places such as Canada and Norway are experiencing environmental consequences today. The North is warming faster than other regions. I live in Canada, and in 2024 we only had four days of snow during the winter in my community. Mind you, I live in the south of Canada, but it did not snow at all in January there, which is not normal. We are indeed experiencing climate change.

As an educator working within the Oil Museum of Canada, I am eternally conflicted about the role of petroleum in the cultural landscape of my community. One day I may be fascinated by the technological achievements of the early oil industry and the next day heartbroken by the lack of environmental awareness and damage done during the historical period of the late 1800s by the local oil drillers. Oil continues to play a pivotal role in my local community and more generally in the Canadian cultural landscape. As a museum educator, I face a daily struggle to deliver balanced educational programs that challenge students to think deeply about their place in a fossil-fueled world.

CMS: One of the main goals of energy humanities (an emerging field that examines how "energy resources, systems, and use patterns shape the material, social and cultural conditions of modern life" (Williams 2020) is to bridge theory with practice. Do you see your work as accomplishing this goal?

CS: Yes, because our programs are designed specifically for students in grades 5–12. At the museum, we try to address energy development and the environment through multiple viewpoints, for example by looking at how energy is consumed through fueling our vehicles, heating our homes, or powering our various personal devices. We delve into the financial costs but also the environmental costs such as greenhouse gas emissions. Responses to these questions can be found on our website under our Energy Conservation or Environmental Resource Management programs. We ask students to calculate the cost of energy use in their respective homes through a math-based worksheet. This exercise connects students' personal lives to the financial aspects of energy consumption but also reinforces that they are energy consumers with a role to play in energy markets. Finally, once students understand that energy has a financial and personal cost, we lead them to investigate where energy comes from, how energy consumption impacts the environment, and how we can all reduce our energy needs through simple steps such as walking to the store, turning off lights or adjusting the thermostat.

As students mature and develop more complex mental frameworks of understanding, we can consider community and environmental impacts of energy extraction and infrastructure. At this point, the museum moves towards a more conversational approach with students, providing opportunities to explore how energy and petroleum impact different groups within our community, such as urbanites, farmers, environmental conservationists, or ideas put forward by the UNESCO to achieve the UN's sustainable development goals. These learning opportunities can take the form of in-classroom debates or post-museum visit guided discussions that are facilitated by the

museum through digital technology such as Zoom or MS Teams meetings. To assist teachers, lesson plans, worksheets, presentation slides, and rubrics are provided. Oil and energy development is a complex social, environmental, and economic issue that is intimately tied to our local history and future. It is sometimes difficult for students to understand that there are no right answers but varying shades of grey when analyzing this topic through the lens of multiple viewpoints or levels of sustainable development.

JS: As Christina mentioned, we live in an oil world, both in terms of energy use and of all the oil-based products we use. I cannot say that I use the term "energy humanities" specifically in my work, but my colleagues and I see it as important to teach students that both oil and gas are highly material. They are highly physical things, which impact our social relations—or at least our economy. The lack of energy can also be a motivation for war and conflict (which has been proven several times in the Middle East and has also become clear in Russia's attack on Ukraine).

CMS: Both of your museums' titles include the name of their host nations—Canada and Norway. How do you navigate this *national* focus of your institution with the *local* stories you want to share and the local communities you want to engage?

CS: The Canadian federal government recognized the importance of our site and its development of the oil industry as early as 1925, which is when it was designated as a national historic site. But the museum is owned by the municipality, the County of Lambton. We are not funded by the Government of Canada—it is the local taxpayer dollars, provincial grants, such as the Community Museum Operating Grans, and revenues from admissions that support us. While the OMC has national significance, our presence is indeed very local. We start our explanations at the local level and move out into the national and international impacts of our local industry.

We are named the Oil Museum of Canada because when we opened in 1960, we were the only museum in Canada focused on oil, and because we were the first commercial oil well to operate in North America. Our community began an oil industry even before our U.S. neighbors, although they do not like to admit it. We focus on the local groundwork that laid the foundation for the international oil industry. The development of local drilling technologies and refinement practices were key to national and global development. For example, it was local money that founded the oil wells in Alberta. It was also local drillers (with local money) who went to Egypt and Persia in 1905, to Talara, Peru in 1914, then to Borneo in 1879. The objects and souvenirs these local workers brought back with them became the foundation of our "cabinet of curiosities," in effect of our museum as a whole. The colonial role of oil is one of our legacies. How do we interpret it? We are eternally conflicted on how to interpret that colonial history. We focus on how workers—we call them the "international drillers"—exported those development and refining practices around the world. We simply do not have the resources to focus on this topic more critically or deeply at this time.

JS: Listening to Christina, it becomes clear that Norway has a shorter oil history than Canada. Long before oil was found on the Norwegian continental shelf, Canadian oil workers were ready to export their knowledge. One of the countries needing this

knowledge was indeed Norway, even though Norway mostly imported its knowledge from the U.S. Today, however, Norway has become quite important in the oil industry, especially in subsea technologies, and some Norwegian companies have become global. For instance, the Norwegian company Equinor—previously named Statoil—currently operates in many countries. It was owned by the state until it was partly privatized in 2001. One of the most crucial motives for privatizing Statoil was that the company wanted to operate internationally without having to seek government approval for each expansion.

Now that Norwegian companies such as Statoil operate in many countries, we can of course talk about the environmental impacts of oil production, but we can also question the kind of deals the companies make abroad; are they corrupt, are they exploitative? It is quite ironic because, in Norway, we are skeptical of international companies coming to "take our things" (for example, part of our railway is now operated by a British firm), but we praise our own companies for going global. I think it is a bit hypocritical.

CMS: What books or other cultural works have recently inspired your teaching practice?

CS: I have recently been inspired by the work of Emma June Huebner of Concordia University and her work onthe evolving role of social media in museum education. I am fascinated by the way young people seek to engage with history through new mediums and short-form video formats. The digital realm of museum work expands to reach audiences beyond the museum walls, and I want to be a part of that trend. Huebner's work has encouraged me to include social media as part of our educational toolkit and to create learning experiences from our museum specifically for social media users.

JS: The picture book *Kubbe Lager Museum* ("Block is Making a Museum") inspired me when I wrote the script for our 25-year jubilee in 2024. It is a book for children about a character named Kubbe ("Block") who makes his own museum. I have also used the book when I worked in Hammerfest. My most inspiring recent experience, however, was a visit to an oil platform named Gullfaks A. Two of my colleagues and I spent three to four days on the platform, taking pictures and talking to people for a project in which we write about the history of the Gullfaks field. The results will be published by the end of 2025.

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References

CLEAR Center. "What is Carbon Sequestration and How Does it Work?" CLEAR Center, September 20, 2019. https://clear.ucdavis.edu/explainers/what-carbon-sequestration.

Huebner, E. J. *TikTok: The Evolving Role of Social Media in Museum Education.* Museum Social Media Cultures Research Network, February 29, 2024. https://youtu.be/gDNBX8ItNGw.

Johnsen, Åshild Kanstad. *Kubbe Lager Museum.* Oslo: Gyldendal, 2010.

Lambton Museums. "Oil Museum of Canada." Accessed June 26, 2024. https://www.lambtonmuseums.ca/en/oil-museum-of-canada/oil-museum-of-canada.aspx.

Norges Bank Investment Management. "About the Fund." Accessed June 26, 2024. https://www.nbim.no/en/about-us/about-the-fund/.

Norsk Oljemuseum. "About the Museum." Accessed June 26, 2024. https://www.norskolje.museum.no/en/om-museet/.

Oil Museum of Canada. "Conservation of Energy." Accessed June 26, 2024. https://docs.google.com/presentation/d/1VX1267DlUru_Uy0BKZ6fkt9LLkFLSiHkBK2ttgyhN0U/edit#slide=id.p.

Oil Museum of Canada. "Environmental Resource Management." Accessed June 26, 2024. https://docs.google.com/presentation/d/1gg3dVPEXVx11hrYgm9-ys72q2clYeF9LRtccxfP84yc/edit#slide=id.p.

Williams, Casey. "Energy Humanities." *Energy Humanities*, October 6, 2020. https://www.energyhumanities.ca/news/energy-humanities-casey-williams.

Virtue Ethics and Ecosabotage

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<quote> *"A structure based on centuries of history cannot be destroyed with a few kilos of dynamite." – Pëtr Kropotkin* </quote>

A recent spate of climate protests and mass-movement civil disobedience events around the world has reinvigorated mainstream discussion of the ethics of civil disobedience, direct action, and the sabotage of energy infrastructure. Moral, political, and strategic issues that faced the twentieth-century coalminers' movements are resurfacing quickly in today's popular press.[1] To take just one example, Andreas Malm's recent book, *How to Blow Up a Pipeline* (Verso, 2020), has received a great deal of attention, inspiring a 2022 film with the same title. Several other recent films address the topic explicitly, including the Oscar-nominated *First Reformed* (2017). Finally, the genre of climate fiction ("cli-fi") is replete with depictions of organized ecosabotage and ecoterrorism. In this paper, I examine how the framework of virtue ethics can be applied to the "direct actions" that have been either performed or contemplated in response to the global climate emergency.

Moral Frameworks

Traditional moral philosophy divides into three competing camps: (i) deontologists, who stress rights and freedoms, inspired by the works of Kant and Locke; (ii) consequentialists, who calculate the costs and benefits of an action, following the principles of Bentham and Mill; and (iii) virtue ethicists, whose main concern is the cluster of character traits that contribute to human flourishing, as characterized by Aristotle, Confucius, Aquinas, and their intellectual descendants.

[1] Timothy Mitchell, *Carbon Democracy: Political Power in the Age of Oil* (Verso Books, 2013).

More recently, philosophical discussion of environmental issues has yielded the "biocentrist" philosophies of deep ecology, social ecology, eco-feminism, and anarcho-primitivism.[2] These begin with an explicit commitment to the intrinsic value of living beings, species, and ecosystems, putting them at odds with today's carbon-based industrial systems of production. The practical proposals that emerge from such philosophies are often quite radical—e.g., the wholesale dismantling of petrocapitalism—and their prescriptions for private/local action sometimes include the sabotaging of the soft and hard energy infrastructure that feeds the climate crisis.

Advocates of the traditional moral theories have broached these topics. Predictably, many deontologists oppose ecosabotage on principle. The violation of laws and rights—especially property rights, for libertarians—is always intolerable, irrespective of the potential benefits. This is especially true of actions that disable key chokepoints in the supply of energy, thus affecting a great many freely made contractual agreements. In-house debates ensue about whether the right to self-defense, or the defense of other rights-holders, can serve as a trump card here. On the other side of the fence, consequentialists, who have no *in-principle* objection to any specific type of action, nevertheless condemn ecosabotage on the grounds that it is often ineffective, counterproductive, dangerous, and destructive of social harmony.[3] This is, again, especially true of actions that affect the lives and livelihoods of those who participate in the carbon economy—which is to say, virtually everyone. But what of the third traditional account? What say the virtue theorists? This is the question I seek to address here. Virtue ethics seems ideally suited to an examination of extra-legal acts. On this approach, the focus is *not* on domestic legislation, global policy, or universal principles. Nor does it offer a *decision procedure* that yields concrete verdicts on individual actions. Rather, the questions at issue for the virtue ethicist are about the character traits that an agent expresses in choosing to perform or forgo a course of action, and the bearing of those traits on a flourishing human life.

There is a way in which each of the three traditional moral theories can attempt, however implausibly, to usurp their rivals. The consequentialist (e.g., the rule-utilitarian) might claim that following the deontologist's rules about rights and duties would, on the whole, lead to better outcomes. Likewise, they might claim that any plausible list of moral virtues would include all and only those character traits whose exhibition tends, on the whole, to bring about positive consequences. In a similar fashion, the deontologist can assert that maximizing personal liberty will

[2] Arne Naess, "The Shallow and the Deep, Long-Range Ecology Movement," *Inquiry* 16, no. 1 (1973): 95–100; Paul Taylor, *Respect for Nature: A Theory of Environmental Ethics* (Princeton University Press, 1986); Joseph R. DesJardins, *Environmental Ethics: An Introduction to Environmental Philosophy*, 5th ed. (Cengage, 2013).

[3] Thomas Young, "The Morality of Ecosabotage," *Environmental Values* 10, no. 3 (2001): 385–93; Bron Taylor, "Resistance: Do the Ends Justify the Means?" in *State of the World 2013*, ed. Linda Stark (Island Press, 2013), 304–316.

coincide with maximizing utility and treat the virtues as those character traits that an agent must have in order to properly interpret and apply the moral law.

Here, we pursue a different line. The proposal is to conceive of the virtues in such a way as to *incorporate* both the consequentialist's calculations of benefit/harm and the deontologist's considerations of rights/duties. We accomplish this by highlighting the intellectual virtues of prudence and skilled instrumental reasoning, as well as the moral virtues of wisdom and justice. The maximally virtuous agent is one who calculates optimally—which includes having meta-cognitive policies about when to *stop* calculating—and has the requisite compassion, impartial character, sense of justice, commitment to duty, love of freedom, and perception of fairness to implement whatever policy the consequentialist or deontologist would deem best. When those two approaches conflict—as they notoriously do (e.g., in cases of liberty vs. security)—the virtuous agent has the prudence and wisdom to perceive which must give way, and to what degree.

More ambitiously, we can attempt to incorporate the insights of the aforementioned biocentrist philosophies by conceiving of virtuous agents as those who have—in addition to the usual virtues—traits that pertain specifically to their relationship with nature, the environment, non-human life-forms, and the biosphere as a whole. Many proposals along these lines have been explored.[4] The present discussion is intended to be a contribution to this broader current.

A Typology of Direct Actions

Before applying the framework of virtue ethics to the specific case of environmental direct action, we must delineate the types of acts that comprise this category and then proceed to examine what they have in common and where they diverge in respect of goals, tactics, and results. Often, the most widely-reported actions are harmless pranks, such as the throwing of soup at famous museum paintings, the spraying of Stonehenge with a rapidly-disappearing orange substance, and the dousing of the UK finance ministry with fake blood. The goal of such actions is to draw public attention to the role of fossil-fuel companies, financiers, and government officials in the ever-deepening climate crisis. Notably, there have recently been several cases of public self-immolation and self-mutilation in the service of this goal.

[4] Geoffrey Frasz, "Environmental Virtue Ethics: A New Direction for Environmental Ethics," *Environmental Ethics* 15, no. 3 (1993): 259–74; Alasdair MacIntyre, *Dependent Rational Animals: Why Human Beings Need the Virtues* (Open Court, 1999); Louke van Wensveen, *Dirty Virtues: The Emergence of Ecological Virtue Ethics* (Humanity, 2000); Ronald Sandler and Philip Cafaro, eds., *Environmental Virtue Ethics* (Rowman & Littlefield, 2005); Ronald Sandler, *Character and Environment* (Columbia University Press, 2007); Brian Treanor, "Environmentalism and Public Virtue," *Journal of Agricultural and Environmental Ethics* 23, nos. 1–2 (2010): 9–28; Dominika Dzwonkowska, *Virtue Ethics and the Environment*, 1st ed., *Routledge Environmental Ethics Series* (Routledge, 2024).

More generally, acts of "civil disobedience" are typically non-violent in their tactics and intended primarily to raise awareness in commonplace contexts—shopping malls, public buildings, banks, corporate offices, political fundraisers, academic lectures, airports, and museums. The goal is to interfere with "business as usual" by disrupting the complacency of the target institution and its participants. Actions in this category include blocking street traffic, disrupting public events with nudity or slogans, doing "sit-ins" in banks and shopping malls, blocking government buildings, interrupting political meetings, invading corporate offices, and "occupying" public spaces. Such tactics are familiar in a variety of historical struggles and are exemplified today in climate protests across the world.[5] Indeed, in 2019, a group of London scientists made explicit the case for civil disobedience in the modern era, and, in 2022, the heirs to fossil-fuel fortunes even bankrolled such actions.

Some environmentalists advocate transitioning from social disruption as an awareness-raising tactic to a more direct engagement with industry practices. While remaining non-violent activists have targeted the logging, shipping, and animal agriculture industries—e.g., by putting unauthorized warning labels on meat and dairy products in supermarkets, breaking into factory farms to videotape the conditions or remove the animals, blockading whaling vessels, immobilizing or damaging logging and shipping equipment, and climbing trees to prevent them from being felled.

The types of ecosabotage most relevant to the production and transport of carbon-based energy aim to disrupt extractive activities, including logging, drilling, fracking, and mining. Sabotage of this kind can be carried out in an incontestably nonviolent fashion, using blockades and sit-ins, but it can also involve various kinds of property destruction. Actions in the latter category range from small-scale pranks that target individual vehicles and private planes, to more serious acts such as the burning of car dealerships and blocking of the construction of oil pipelines by trespassing on corporate or federal land. Some have gone so far as to sabotage critical energy infrastructure—including, of course, blowing up those pipelines.[6]

For completeness, we can include the sorts of extremely violent actions that are exemplified by the infamous "Unabomber", Ted Kaczynski—e.g., the mailing of homemade bombs to individuals who are perceived to play a large role in climate destruction—or, in the most extreme case, the targeted assassination of policymakers, lobbyists, or industry leaders, which constitute the central subject matter of many novels and films. Plainly, there are gradations of such direct action, which range from harmless pranks all the way up to federal crimes. The philosophical work of analyzing the conceptual differences between civil disobedience, ecosabotage, and ecoterrorism

[5] Mitchell, *Carbon Democracy*.

[6] Christopher Ketcham, "The Machine Breaker: Inside the Mind of an 'Ecoterrorist'," *Harper's Magazine*, 2023; Andreas Malm, *How to Blow Up a Pipeline: Learning to Fight in a World on Fire* (Verso, 2021).

is ongoing, and I will not rehearse those debates here.[7] Having surveyed the range of actions that constitute our subject matter, let us now apply the framework of virtue ethics to them.

Virtue Ethics and Ecosabotage

We can begin by asking what character traits are expressed in an act of ecosabotage. In what follows, I will first list what I take to be the virtues and then examine the vices. Judging by both the fictional depictions of ecosabotage, as well as by the factual historical record, eco-saboteurs rank high on compassion, love, generosity, courage, bravery, self-sacrifice, persistence, dedication, focus, burning passion, and zeal. Their devotion to a cause beyond themselves expresses a deep emotional—perhaps even spiritual—solidarity with a social and ecological systems much larger than themselves. They seek justice in defending the rights of the voiceless—impoverished communities contaminated by industrial toxins, factory-farmed animals, wildlife, ecosystems, and the weightiest of silent majorities: the future generations of both humans and other species. It is primarily for the sake of the latter that saboteurs target the energy and financial systems that undergird the carbon-dominant order.

As moral virtues shade off into intellectual ones, we can add to our list the eco-saboteurs' independence of mind and reasoned non-conformism, as well as their big-picture conception of the biosphere—its inhabitants and political systems—their willingness to face up to difficult realities, their progressive mindset that seeks to move humanity in a better direction, and their desire to share an important truth with the world. Finally, successfully implementing their plans and remaining undetected for substantial periods of time plainly involves knowledge, skill, cunning, ingenuity, and technical prowess. This is, by any measure, an impressive list of virtues. It is not hard to see why their exaggerated manifestation in the eco-saboteur can sometimes give an air of saintliness—an inspiring image of the lone righteous and selfless devotee of truth, beauty, and justice. But we must now balance our perspective with a consideration of the vices that are found in both the fictional and real-life eco-saboteurs.

Extreme actions can be fueled by an inflated ego, which, when combined with feelings of powerlessness in the face of a genuine crisis, continuously feeds the vices to which the agent is already prone. One example of this situation is the intellectual dogmatism that both makes it difficult to take seriously alternative perspectives and, moreover, exaggerates the likelihood that eco-saboteurs' actions will have a net-positive effect at all on industrial practices, faraway people, wild animals, or future generations. Other vices include an obsessive sense of doom, a lack of composure, and a blind retributivist rage. Let us dwell on the latter for a moment.

[7] Michael Martin, "Ecosabotage and Civil Disobedience," *Environmental Ethics* 12, no. 4 (1990): 291–310; Jennifer Welchman, "Is Ecosabotage Civil Disobedience?" *Philosophy and Geography* 4, no. 1 (2001): 97–107.

Vengeful rage can be caused by a personal infringement—a loss of land or livelihood—and might therefore take a narrow target, such as the business entity that caused the trouble. This is no different from any other type of vengeful hatred, even if the resulting act carries political significance to other interested parties. By contrast, when righteous anger is directed at large-scale social systems and industries—"technological society," "modern capitalism," or "big oil"—the character traits on display are often *not* love and compassion but a deep misanthropy that finds its ultimate expression in ecofascism.

Virtue ethics is deeply informed by the works of Aristotle, Confucius, and the Islamic and Christian traditions, all of which stress the paramount importance of family and friendship—the foundations of our social being. It is thus a fact of singular importance that a committed eco-saboteur will be practically incapable of having close family bonds, trusting friendships, and other long-term personal projects/goals—the core elements of a good human life. The illegality of their actions requires living an isolated life, often in hiding, fearful, distrustful, and closed off to others. Any attempt to retain social bonds will require engaging in an inordinate amount of deceit and dishonesty with anyone who gets close. And with regard to collaborators, there will always be the reasonable worry that they are either already working for law enforcement, or will buckle under threats from the authorities. As the members of the ELF/ALF learned in the early 2000s, even the strong bonds between collaborators can wither and fray, leading to confessions and arrests years later. That being so, a sustained commitment to ecosabotage is difficult, and perhaps impossible, to square with individual-level flourishing, when the latter is properly conceived of as a life-long developmental process that requires intimate relations with family and friends. Importantly, this is so regardless of whether the actions taken are successful and remains true even in those (rare) cases when the saboteur escapes detection.

A Virtuous Saboteur?

A useful way to conceptualize the matter is to return to our fictional idealized construction of the maximally virtuous agent. In this context, our goal is to see whether a prolonged engagement in ecosabotage can plausibly be undertaken by such an agent. What we find, I claim, is that the conditions under which this is possible are *very* tightly circumscribed. It is, in other words, unlikely in the extreme, though perhaps not impossible, that any actual eco-saboteur can live up to the ideal. To play this game, we set the hypothetical agent's virtue parameters maximally high and reduce or eliminate factors that contribute to the acquisition/possession of vices. For instance, the ideally virtuous agent will feel disgust in performing (or even considering) actions that disturb the social order, even if she is simultaneously aware that those actions *must* be performed in pursuit of a more worthy cause, or that the social order in question is itself morally indefensible. Such an agent would take no pleasure in committing

inherently destructive or anti-social acts, nor be motivated to perform them by spite, wrath, vengeance, jealousy, ambition, hatred, arrogance, fear, misanthropy, or petty personal grievance. In the course of conceiving, planning, and carrying out those acts, she must at no point be drunk with power, delusional, or intemperate—in short, she must have *excellent* impulse control. Perhaps most importantly, our maximally virtuous agent must have a keen sense of justice.

Our hypothetical agent must also have the intellectual virtues—including the foresight to anticipate the n[th]-order consequences of her actions, the intelligence to carry out the action successfully, the prudence to justifiably believe that the action will do more good than harm, the wisdom to comprehend what moral and political risks she is undertaking and what responsibilities she is either shirking or fulfilling in the process. The reasoning she employs must not be dogmatic, confabulatory, or otherwise epistemically suspect. She must be open to conflicting perspectives, mindful of her own epistemic limitations, and able to "feel the force of the better reason". This involves, at a minimum, actively seeking and duly considering counterevidence to her viewpoint, appreciating its import, and adjusting accordingly.

I submit that none of the examples we find in fictional or historical accounts of eco-saboteurs come close to satisfying this description. Many are fueled directly, perhaps *entirely*, by wrath and vengeance—a burning hatred for climate criminals, past, present, and future. Some are woefully ill-informed and emotionally unprepared—almost delusional about the task they have set for themselves. Others are ego-maniacal, power-hungry, and sadistic. And still others act out of personal grievance such as the loss of a home or an occupation. None, as far as I can tell, are capable of balancing their commitment to direct action with their personal responsibilities to friends and family.

If there is a distinctive intellectual error in the eco-saboteur's motives, it is the one embodied in the words of Kropotkin, with which I began. There is, unfortunately, a fundamental mismatch between the global, systemic nature of the problems that we face and the isolated actions of private individuals. The course of life on Earth cannot be affected by even a major successful act of sabotage. The future of species, or the environment, increasingly threatened by the carbon consumption that fuels our energy-hungry lifestyles, is simply too big for that. But neither is there a call to acquiesce in what Barney calls "the cynical position that, under conditions of petrocapitalist totality, meaningful action is impossible prior to a fundamental transformation that is beyond our capacity to effect."[8] Organized broad-based social and political movements have produced meaningful results in the past, and they can do so again in the present context. The fact is that nonviolent tactics work, and there is evidence that they are more effective than the alternatives.[9]

[8] David Barney, "Beyond Carbon Democracy: Energy, Infrastructure, and Sabotage," in *Energy Culture: Art and Theory on Oil and Beyond*, ed. Imre Szeman and Jeff Diamanti (West Virginia University Press, 2019), 214–228.

[9] Johannes Brehm and Henri Gruhl, "Increase in Concerns About Climate Change Following Climate Strikes and Civil Disobedience in Germany," *Nature Communications* 15, no. 2916 (2024); Kevin

When digesting the climate science and the truly dire forecasts for the future of our planet, one naturally takes a god's-eye perspective on the matter. But things go awry when this viewpoint carries over into one's planning of practical projects, leading one to assign historical significance to actions that are, in fact, of little or no consequence with regard to the crisis at hand. A virtuous agent, I conclude, recognizes the limits of her private sphere of action.

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A. Young and Laura Thomas-Walters, "What the Climate Movement's Debate About Disruption Gets Wrong," *Humanities and Social Sciences Communications* 11, no. 25 (2024); Erica Chenoweth and Maria J. Stephan, *Why Civil Resistance Works: The Strategic Logic of Nonviolent Conflict* (Columbia University Press, 2011).

The Rise and Fall of Energiewende: A Case Study in Horse Racing Syndrome

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A dozen years ago, the *New York Times* introduced a new word into its vocabulary: *Energiewende*. Chancellor Angela Merkel's government had accelerated the phaseout of Germany's nuclear reactors after the Fukushima disaster in 2011, and building a new climate-friendly energy system was the order of the day. Moreover, German taxpayers were at the time paying billions of euros as subsidies for renewables. A few years later, the term began to disappear from the newspaper, and the few articles that still cite Germany's *Energiewende* today often reveal skepticism toward the concept. This does not mark the end of the *Energiewende.* It does, however, provide an exemplary case for what I call the horse racing syndrome.

Decarbonizing an industrial economy is a titanic task, and Germany's long love affair with coal does not exactly reduce the challenge. Furthermore, Germany's energy transition is essentially market-driven, and the dynamism of modern capitalism adds another layer of complexity. The *Energiewende* is the cumulative product of countless small steps in a quest that combines profit seeking and environmental sustainability and that makes it tempting to cut through the complexity by focusing on the bottom line. Many observers discuss which country is leading the race to carbon neutrality, which country is doing well in the race, and which country seems to lag behind. In the process, these observers reduce the energy transition to a steeplechase that began decades ago.

This article proposes a different way to conceptualize the energy transition. The following comments will convey a measure of respect for the contingency of the future, as historiographic work is still in its infancy. However, the history of energy has thrived in recent years, as have the energy humanities of which it is a constituent part and many of these studies have identified different bottlenecks for each stage of the energy transition.[1] Focusing on these bottlenecks provides us with a better, more engaging narrative for the energy transition that allows for an alternative to the cheerleading tone of steeplechase narratives. With horses now long out of the energy business, it may also be time to retire them in our collective imagination of energy.

Monopoly power

In the past, it was not difficult to identify the elements crucial to any renewable energy regime. In the 1980s, the then nascent Green Party in West Germany summarized them in less than half a page in its first party program: more efficient power plants, wind and geothermal energy, education for the consumer, and so forth.[2] Some of these elements proved more significant than others. Globally, rigorous curbs on consumer choices have been a nonstarter since the energy debates of the 1970s, fittingly symbolized in the US by the fallout from President Jimmy Carter's infamous "malaise speech" in 1979.[3] But as early as 1980 in West Germany, the Green Party was confident that the energy transition would require neither fundamental technological break-throughs nor a return to pre-industrial production modes or state-mandated restrictions on consumption. Gradual coordinated change at the level of production and transmission would do the job, albeit on a giant scale.

In an open society, it would have been a matter of political will and the right tools to nudge the energy sector into the desired direction. Unfortunately, Germany's energy sector bore greater resemblance to a closed shop. Like in most Western countries, utilities in Germany were categorized as natural monopolies. Thus, there was limited competition as well as limited interest in technological innovation, at least at a time when innovation primarily concentrated on moving beyond coal. German utilities managed a number of alternative energy projects in the 1980s, most famously the Growian wind turbine near the North Sea and RWE's Kobern-Gondorf solar complex on the

[1] This essay draws particularly on Stephen G. Gross, *Energy and Power: Germany in the Age of Oil, Atoms, and Climate Change* (Oxford University Press, 2023), and my own *Atomare Demokratie. Eine Geschichte der Kernenergie in Deutschland* (Franz Steiner, 2022). Credit is also due to the students who attended my courses at Ruhr University Bochum during the winter term 2023/24, where the following thoughts took shape.

[2] Die Grünen, *Das Bundesprogramm*, 11, available online at https://cms.gruene.de/uploads/assets/1980_Grundsatzprogramm_Die_Gruenen.pdf (retrieved May 23, 2024).

[3] Daniel Horowitz, *The Anxieties of Affluence: Critiques of American Consumer Culture, 1939–1979* (University of Massachusetts Press, 2004), 238.

banks of the Mosel River.[4] However, both projects brought meagre results that did not inspire subsequent investments. Moreover, there are indications that energy companies did not mind terribly that these projects were not greatly successful. Managers could henceforth cite the failure of renewable energy projects when they argued for the continued primacy of fossil fuels.

It took a rare political maneuver to break the logjam. The original impulse came from the peculiar blending in Bavaria of personal and political interests known as *Spezlnwirtschaft*. The ambiguous hero of this event was Matthias Engelsberger, member of the federal parliament for the conservative Christian Social Union (CSU). Engelsberger pushed for a law that compelled energy companies to buy renewable electric power at fixed tariffs. It was a personal issue for him: his family owned a sawmill that had potential for hydropower and, in the sunset phase of his career, he was largely immune to electoral repercussions for self-interested policy making. The ecological implications were clear, however, and the law passed with support from the Green Party and the Social Democrats in 1990. With that, companies could finally be sure that utilities would buy renewable energy.[5]

A climate for investments

Engelsberger's law triggered a boom in wind energy investments. The market was still abysmally small by today's standards, but it was enough to scare the German energy establishment. Company lawyers drafted legal opinions that curtailed the law's enforcement. Less visibly, lobbyists sowed doubts about the legitimacy of climate policy. Much of that anti-environmental plotting is still waiting to be examined: while climate change denial in the US has been studied extensively, comparable research is still in its infancy for Germany, and certainly not for lack of deniers' nefarious activities.[6] Claudia Kemfert reported that she still heard the familiar climate denial nonsense in the halls of power in the 2010s.[7]

These companies' and lobbyists' activities stalled the *Energiewende*, but a new coalition of Social Democrats and Greens came to power in Germany in 1998 and revived it. From 1998 to 2005, the charismatic chancellor Gerhard Schröder, whose energy policy achievements are now overshadowed by his incessant lobbying for Russian gas, led these efforts. Already in the early 1990s, following another *Wende*—the peaceful revolution that overthrew the communist dictatorship in East Germany—Schröder was eager to

[4] Matthias Heymann, *Die Geschichte der Windenergienutzung 1890–1990* (Campus, 1995); Joachim Radkau, "Das deutsche Drama der Solarenergie: Zwischen Triumph und Tragödie," *Geschichte im Westen* 38 (2023): 131–155; 140.

[5] Gross, *Energy and Power*, 234–236.

[6] Naomi Oreskes, Erik M. Conway, *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming* (Bloomsbury, 2010)

[7] Claudia Kemfert, *Schockwellen: Letzte Chance für sichere Energien und Frieden* (Campus, 2023), 167.

break the logjam that blocked new investments. "We ceased doing energy policy in the Federal Republic of Germany ten years ago," Schröder wrote in a memorandum for the presidium of the Social Democratic Party (SPD) in 1993. The report took aim at the prevailing mood in leftist circles, where an anti-nuclear stance had overshadowed everything else (except coal subsidies) since the 1980s and thereby undermined the left's ability to spark wider changes in environmental policy. The title of the report itself warned "not to take intentions as deed" (*Nicht die Absicht schon für die Tat nehmen*).[8] Schröder understood that real change was about investments rather than convictions, and companies needed reassurance that there would be a market for renewable energy. When he became German chancellor in 1998, the share of renewables (excluding hydropower) was still below two percent.[9]

Schröder's government combined a planned phaseout of nuclear power with financial incentives for renewable energy projects and largely stuck to the general framework of the 1990 law. The government set prices for different types of renewables and gave them priority on the electric power market: utilities could not block the sale of renewable power at times of abundant supply. Subsidies were inevitably expensive, but they were set to decline over the years in the hope of stimulating innovation, and the marginal market share of renewables curtailed costs during the first years of the transition. Investments in renewables were finally attractive from both a financial and a sustainability point of view, and windmills, solar panels and reactors for biogas became familiar features of the German landscape.

In retrospect, the most remarkable aspect of the red-green energy policy was that it was based on an agreement between the government and the utility companies on the gradual phaseout of nuclear power. West Germany's reactors had permits without an expiration date, quite unlike nuclear power plants in the US, where utilities need to reapply for a license to operate after a specified time. In Germany, these permits were the chief obstacle for phaseout plans among anti-nuclear policymakers. Utility companies were certain to claim economic damages if a government imposed a time limit by law or decree, and estimates of potential costs amounted to staggering numbers. Anti-nuclear sentiment had spread through major parts of the German electorate, but it was less than certain whether taxpayers would welcome a nuclear phaseout when it came with a price tag in the range of tens of billions of euros.

The consensus over nuclear energy was the result of intense negotiations that spanned an entire decade. But why did German utilities accept an agreement that placed a time limit on their investments? Many factors figured into their acceptance, but at the end of the day, it was simply good business. The pros and cons of nuclear power had been fixtures of German political discourses since the 1970s, but energy

[8] Archiv der sozialen Demokratie Bonn, SPD-PV-Bestand 2/PVAS Präs. 25.10.93, Bericht von Ministerpräsident Gerhard Schröder zu den Energiekonsensgesprächen für die Präsidiumssitzung der SPD am 25.10.1993, 1.

[9] Klaus-Dieter Maubach, *Energiewende: Wege zu einer bezahlbaren Energieversorgung,* 2nd ed.(Springer VS, 2014), 64.

managers were not in the mood for endless debates. The energy business entails enormous amounts of fixed capital, and corporate captains cherish reliable parameters for investments. A time limit on permits would lead to a financial loss, but if it came with a legal guarantee that the plants could operate unchallenged for up to two additional decades, the proposition was worth discussing. Interestingly, it was the utility companies that talked about the need for a "consensus in energy policy" years before negotiations started in earnest. In May 1990, Hermann Krämer, CEO of PreussenElektra, presented a policy paper in the name of all German utilities operating nuclear power plants that included a pledge to be available for a "constructive dialogue."[10]

Dynamic energy markets

The ensuing nuclear consensus was a product of the late "Deutschland AG." Representatives of large German corporations spoke with each other and government officials on a regular basis. If interests converged, the companies were ready to strike a deal. These negotiations helped to reduce the uncertainties inherent in doing business, thus mitigating the risks of costly mistakes and nerve-racking conflicts. However, negotiations among a cartel of corporate captains required a reasonable degree of certainty that newcomers would not be able to dart ahead and sideline negotiations with bold initiatives. The electric power business had been the prototypical case of a market with limited competition as long as utilities were monopoly suppliers within designated regions by law. This situation, however, crumbled in 1996, when the European Union (EU) called for changes in the electric power sector in order to create the common market for energy. Private consumers gained the right to switch suppliers, and competition emphasized prices and sustainability pledges. The result was a dynamic market, something most utility companies had not experienced in decades.

Despite the reintroduction of price competition, the new energy market was hardly a neoliberal dream. Regulators favored renewable energy projects in order to achieve climate policy goals, or rather to avoid missing these goals by even wider margins. The system of fixed prices for carbon-neutral electricity was inevitably at odds with free market utopias, and adjustments were part of the plan from the outset. But identifying the right price was a challenge: subsidies were meant to incentivize investments but not allow excessive profits. Relatedly, total expenses were supposed to remain within reasonable limits. In other words, the energy transition had become a delicate balancing act in regulatory politics, and not everyone was up to the challenge. The second coalition government under Angela Merkel failed in its management of subsidies in the aftermath of the Fukushima disaster in 2011, and rising costs provoked feverish attempts to reduce the costs of the energy transition. The government patched together

[10] Hermann Krämer, "Zur derzeitigen Situation und zukünftigen Rolle der Kernenergie. Positionspapier der kernkraftwerksbetreibenden Unternehmen der öffentlichen Stromversorgung," atw 35 (1990), 384.

a break on electric power prices (*Strompreisbremse*), and the new rhetoric focused on curbing costs, never mind that these costs were invariably linked to another stated policy goal. The net result was that the much-hyped *Energiewende* proclamation was essentially hollow by the next election in 2013. Energy policy remained a fudge during the remainder of Merkel's tenure in office.

In part, this is because Merkel's governments dithered about the elephant in the room. Amidst all of this talk of *adding* renewables to the energy mix, no one produced a fitting plan for actually *replacing* fossil fuels. When and how would Germany phase out coal? Subsidies for domestic coal production were one of the sacred cows of German politics, and not just because of Social Democratic concerns about mining jobs. Helmut Kohl had intervened forcefully in 1997 when his fellow Christian Democrats were openly discussing a planned phaseout of coal mining, unequivocally declaring, "This will not happen as long as I am chancellor."[11] Under Merkel, adopting a wait-and-see attitude, Germany was not among the founding members of the Powering Past Coal Alliance, an international coalition launched by Canada and Great Britain in 2017. When it joined in 2019, it did so after agreeing on an extremely costly phaseout policy. The price tag added up to a million euros for every job in coal mining. It was a debacle foretold.[12]

In 2021, Germans elected a new coalition government that includes the SPD, the Greens, and the neoliberal Free Democratic Party (FDP). Their early attempts to further the *Energiewende* were quickly overshadowed by Russia's invasion of Ukraine, and while much points to a reinvigoration of the energy transition, it would be premature to provide an assessment at this point. However, the essentials ring familiar. At its heart, the energy transition is a business project, and everything revolves around investments, corporate strategies, and permits, which all have a measure of complexity. Moreover, few companies invite transparency about their business plans, and parameters such as load factors on power grids sound like the perfect issue for nerds. But for all the insider code, there are ways to communicate challenges beyond expert circles. There is even a decent slogan at hand for the name of the game: "it's the economy, stupid." But then, you can always shift into horse racing mode.

A time for legends

Conversations do not end when the horses have crossed the finishing line. A big part of horse racing is about retrospective ruminations on who failed and for what reason. Maybe nuclear power would have rebounded in Germany after Russia's assault on Ukraine if policymakers had read the right memo? This scenario was the essence of

[11] "Die Machtfrage stellen," *Der Spiegel* no. 12 (March 16, 1997): 22–26; 25.

[12] I wrote an op-ed column for *Focus Online* at the time, and I was pulling my hair out in real time. See: Frank Uekötter, *Einfach war Gestern: Über Umweltpolitik in unruhigen Zeiten* (Munich: oekom, 2021), 15–33.

a May 2024 cover story in *Cicero*, a German self-styled "magazine for political culture". The journal had sued the Federal Ministry for Economic Affairs and Climate Action for access to some of its files and found a memo that declared reactors safe with an extended lifespan. Maybe German reactors would still be on the grid if people had known?[13]

The source base was flimsy at best, but post-race ruminations are rarely about sound evidence. They are about coping with defeat: if you have a penchant for nuclear power (or a job in the business), its demise feels a bit less devastating if it came about due to the shenanigans of faceless bureaucrats. It helps that Merkel's turnaround on nuclear power came after the Fukushima disaster and that the rationale was framed in safety terms. Fears have been a prominent part of the critique of nuclear power since the 1970s, and energy pundits were glad to seize on the issue because it provided a distraction from nuclear power's dismal economic performance. Ten years ago, I wrote an article that there was a new "stab-in-the-back" myth in the air: nuclear power as a successful technology, unfortunately killed by exceedingly timid Germans.[14] It looks prescient now, except that the extent of pro-nuclear sentiment is staggering. Even the Christian Democrats ditched Merkel's post-Fukushima stance: the new party program speaks glowingly of fourth- and fifth-generation nuclear power plants. It takes "new ideas" for a new age of energy, the party asserts, which glosses generously over the fact that Germany's experiment with nuclear power is almost 70 years old.[15]

The times are ripe for more mythmaking. After all, the race is basically over on the energy market. Global investments in climate-friendly energy sources have exceeded investments into fossil fuels for several years, and nothing points to a dramatic comeback of fossils at the expense of renewables in the foreseeable future. The latest news is that 59 percent of German electric power production came from renewable sources in 2024. However, speculating about when that share will reach 70 or 80 percent lacks the excitement of the days when the energy transition was still in its infancy. Furthermore, legends do well on social media, where the fracturing of our collective imagination is on display each and every day. Those platforms thrive on a stock of anger that seems to be the only thing in the world of energy that knows no limits. Horse racing syndrome is the perfect fit for a world with plenty of moral indignation and a nagging inability to connect the dots.

[13] Daniel Gräber, "Der Anti-Atom-Schwindel," *Cicero* no. 5 (May, 2024), 14–25.

[14] Frank Uekötter, "Die neue Dolchstoßlegende. Fukushima und die Mythen der atomaren Geschichte," in: Jochen Ostheimer, Markus Vogt (eds.), *Die Moral der Energiewende. Risikowahrnehmung im Wandel am Beispiel der Atomenergie* (Stuttgart, 2014), 244–260.

[15] CDU, In Freiheit leben. Deutschland sicher in die Zukunft führen. Grundsatzprogramm der CDU Deutschlands, 64, available at https://www.grundsatzprogramm-cdu.de/sites/www.grundsatzprogramm-cdu.de/files/downloads/240507_cdu_gsp_2024_beschluss_parteitag_final_1.pdf (retrieved 22 May 2024).

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