# Energy/Waste: Introduction

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This interdisciplinary volume addresses representations of energy and waste in post-Soviet contexts. The eight chapters of the collection tackle film, literature, poetry, and social movements from a range of perspectives—including literary studies, ecocriticism, film and media studies, and the social sciences—to examine how post-Soviet societies reinterpret and reimagine energy use and waste management, as well as Soviet legacies of large-scale environmental changes, pollution, and resource exploitation. The visualization and conceptualization of energy/waste have wide social, political, and cultural implications. As the record-high oil and gas prices resulting from Russia's invasion of Ukraine in 2022 demonstrate, the impact of energy, and by extension waste, on cultural production and lived experiences remains painfully relevant and immediate.

Energy and waste can each be conceptualized as the inverse property of the other. If energy provides the ability to perform work—to cause change and generate heat, light, and motion—then waste is the unwanted discard of that work. By the same token, waste is an inevitable by-product of any energy-generating process; even production of renewable energy results in significant waste, such as the physical remnants of solar and wind energy infrastructures after their lifecycle's end. The interdependency of energy and waste, as well as their destructive potential, was made visible and gained global attention following the 1986 Chornobyl disaster, when a single nuclear power plant, the source of about ten percent of Ukraine's energy at the time of the meltdown, changed the lives of millions of people across multiple borders and rendered 1,000 square


Slavica Bergensia 14 · doi: https://doi.org/10.15845/slavberg.21.c129

miles uninhabitable for the next 20,000 years. The explosion exposed the inherent risks of nuclear power, as well as the deficiencies of Soviet technology and the inefficiency of the political system, contributing to an awakening of environmental popular consciousness in the socialist world. Moreover, the Chornobyl disaster (including its media legacy) has become synonymous for many in the public sphere with the very idea of nuclear energy, thereby leading to resistance in developing nuclear energy technology, even when studies have shown the health burdens for nuclear power to be smaller than for other forms of energy, including for electric, coal, oil, and natural gas (Markandya & Wilkinson 2007).

In the post-Soviet world, the concept of "energy" (*energiia*) shares a connection to the field of "energetics" (*energetika*), which is largely absent from Anglophone discussions of environmental studies. The word energy itself was first used by Aristotle in the fourth century BCE, but it was Thomas Young who employed it in its modern meaning in 1802. Rapid industrialization and new discoveries in physics and chemistry brought energy and its study to the forefront of Western scientific inquiry in the eighteenth and nineteenth centuries. The study of the nature and production of energy became known as energetics, a term itself coined by William Rankine in 1855 as a thermodynamics concept (Rankine 1855). A number of other scientists across Europe were also exploring the nature of energy and chemical transformations and proposing various definitions of the scope and function of energetics. Most notably, in the 1890s, Wilhelm Ostwald (1896) was inspired to adapt the idea of energetics to philosophy, proposing a monist view of life as based on energy rather than matter. The varied and controversial definitions of energetics and its nature ultimately discredited the term in the West and it went out of popular usage after 1895 (Deltete 1999).

By the late nineteenth century, however, energetics, in its strictly literal understanding as the production and deployment of energy, had been introduced to and adopted by the Russian Empire. During the Soviet period, when industrialization and the need to find ways to produce energy on a large scale were a priority, the concept of energetics gained an even more prominent role. Numerous energetics institutes were established, many of them still in operation at present. Moreover, Soviet geochemist Vladimir Vernadskii (2010) proposed a vision of life as the output of energy created by solar radiation. Vernadskii himself was a proponent of nuclear energy, which initially involved the search for and excavation of

radioactive ores, and sought to harness its power for the development of humankind.

In 1954, the Obninsk nuclear power plant opened, making the Soviet Union the first country to use nuclear power to generate electricity, thereby harnessing the so-called peaceful atom. Concurrently, the military applications of nuclear power were considered just as crucial for Soviet state security. The first successful test of a Soviet atomic bomb was conducted secretly on August 29, 1949, at the Semipalatinsk Polygon in the Kazakh Soviet Socialist Republic. More than four hundred tests followed until the site's closure in 1990. The devastating effect of nuclear testing and nuclear spills on the environment and its inhabitants remains one of the most sensitive and controversial topics in post-Soviet political and cultural discourse. The issues around verbalizing, visualizing, and interpreting nuclear-caused devastation are discussed in this volume by Maria Hristova, as well as by all three authors in the third section devoted to Chornobyl: José Vergara, Haley Laurila, and Irina Souch.

In Russia, the continued significance of the energy sector, including nuclear power, is attested to by the large number of quantitative and social scientific studies of the country as a petrostate, its energy sector, and the mounting challenges it faces with waste management (Goldman 2008; Rogers 2015; Vatansever 2021; Romanov 2020). This type of investigative and scholarly work is, however, much less prevalent in the humanities. Moreover, this is a field that demands interdisciplinary analysis, as it is formed by the meeting of multiple fields of inquiry, much in the way that Vernadskii's work blends geology, radiochemistry, philosophy, and the history of science.

Compared to the notion of energy, the concepts of "waste" or "pollution" as a theoretical framework are much more recent, but they have since developed into a diverse and vibrant field of waste studies. Along with the agenda of climate change, the management of waste has an unparalleled importance for environmentalism and sustainable development. As an interdisciplinary subject, waste studies combines multiple approaches based in the natural and social sciences and the humanities. Recent publications like, *Waste Matters: Urban Margins in Contemporary Literature* (2016) by Sarah Harrison, *The Routledge Handbook of Waste Studies* (2022), edited by Zsuzsa Gille and Josh Lepawsky, and *Discard Studies* (2022) by Max Liboiron and Josh Lepawsky, have contributed to the further formalization of this multidisciplinary field. While waste

studies connects the social sciences and the humanities, most of its research focuses on the capitalist West or the global South and is centrally concerned with capitalist systems of social injustices and global inequalities (Yates & Gutberlet 2011).

In contrast to this approach, this volume will contribute to this topic from the perspective of socialist and post-socialist experiences. Zsuzsa Gille's *From the Cult of Waste to the Trash Heap of History* (2007) first drew scholarly attention to the distinct approaches to conceptualizing waste in socialist economies. Using the example of postwar Hungary, Gille shows that socialist societies developed a cult of waste that valued reuse and recycling, thereby problematizing the long-held belief about the inherent "wastefulness" of socialist planned economies. Due to ongoing shortages and deficits, even packages and wrappers, which in market economies would be considered trash objects, could acquire material value and "added meaning" (Chapman 2013, 143). Perestroika and the subsequent collapse of the socialist block led to precipitous changes in social life, such as the development of market economies and consumerist societies. These socioeconomic developments, in turn, led to dramatic changes in the production and conceptualization of waste, as well as in the replacement of environmentally beneficial recycling and recirculation practices with dumping and waste incineration (Gille 2007, 158–59).

In contemporary Russia, infrastructure for municipal waste disposal, which includes Soviet-era landfills, is often ill-equipped to deal with the post-Soviet increase of domestic and more complex waste (Josephson et al. 2013, 310). The World Bank reported in 2014 that each year Russia produces 55–60 million tons of municipal solid waste, of which only 5–7 percent is recycled or repurposed ("Waste in Russia" 2014); this situation has not significantly improved today. The contemporary crisis of waste management has recently resulted in the so-called garbage protests in many Russian regions; one such protest is discussed in Elena Gorbacheva's contribution to this volume. The practices of locating landfills in Russia's poor and distant regions stems from inequalities of a semicolonial and quasi-imperial nature that characterize the relationship between Moscow and the provinces and peripheries. In the post-Soviet era, capitalism has produced new forms of social alienation based on socioeconomic status often expressed in spatial and regional terms. These potentially harmful perceptions of an individual's value based on their

social standing can be framed through the metaphor of humans as waste. As discussed in the chapters by Irina Anisimova and Masha Shpolberg, waste can become a powerful metaphor for social processes.

Early Soviet culture often represented nature as inherently chaotic and infinitely malleable; it had to be mastered and made to work for the benefit of the new Soviet state (Gor'kii 1964; Oushakine 2004). This extractive mindset ultimately led to the ecological disasters of the late Soviet era, such as the Chornobyl nuclear plant explosion, the Aral Sea desiccation, and widespread soil degradation in Kazakhstan. Combined with perestroika's process of liberalization, these environmental problems solidified, once again (for the first time since the 1920s), a range of independent Soviet environmental movements, closely linked to famous writers and filmmakers (Ianitskii 2016; Zaharchenko 1990). And yet, as Laura Henry's work shows, it is difficult to adequately assess the effectiveness of environmental movements in Russia. Such issues as the diversity of environmental groups and their goals, their exclusion from policymaking, and the effects of the economic collapse of the 1990s make it hard to disentangle any environmental "gains" in the first post-Soviet decade from the simultaneous "severe economic recession and industrial contraction" (Henry 2010, 179; Oldfield 2005).

Despite what the Chornobyl tragedy revealed about the larger Soviet tendency of mismanaging the energy production process, and the resulting statewide protests and activism in the late 1980s and early 1990s, at least where Russia is concerned, not much has fundamentally changed in how the state exploits and benefits from its natural resources. In the 1990s and 2000s, environmental concerns gave way to a preoccupation with economic growth; post-Soviet Russia, it became clear, would preserve the extractive economy model of the Soviet period. Drilling for oil and gas, clearing forests for timber, and mining gold and diamonds has led to poisoned and depleted soil, air, and water (Stoecker & Shakirova 2014, 9). In today's Russia, exploitation of natural resources, water pollution, and deforestation impacts local populations including indigenous peoples. The spill of 20,000 tons of diesel in the Norilsk arctic tundra region in 2021 is just one event in a chain of long-term disasters caused by industrial pollution, according to the International Work Group for Indigenous Affairs (IWGIA). Moreover, transnational production, such as the Sakhalin-1 and Sakhalin-2 integrated oil and gas projects, has caused disruption in the indigenous practices and subsistence economy of ap-

proximately 3,000 Nivkhi, Uilta, Nanai, Evenk, Chukchi, and Itelmen peoples living on Sakhalin Island (Tysiachniouk et al. 2018).[1]

The unsafe disposal of tons of nuclear, chemical, and industrial waste is a growing problem. According to 2022 data from the International Energy Agency, collected before the 2022 Russian invasion of Ukraine, Russia was the world's largest exporter of gas and second largest exporter of oil ("Why Does Russian" 2022). It ranked fourth in the world (after China, the United States, and India) in energy consumption, production of electricity, and carbon dioxide emissions from oil, gas, and coal. Combined with the progressively more uneven distribution of wealth in Russia, these statistics underscore that the energy/waste production process is not a strictly economic issue, but also a political, social, and cultural one.

The reliance on extractive economies characterizes not only Russia, but also other post-Soviet states, such as Kazakhstan, Turkmenistan, and Azerbaijan, where resource dependence has been linked to rising authoritarianism. Belarus and Ukraine, as crucial energy hubs, play a central role in the complex politics of energy flows between Europe, the United States, China, and Russia. This fossil fuel-based geopolitical network became acutely apparent in the days and weeks following the Russian invasion of Ukraine, making visible the world's dependence on Russian oil and gas. The introduction of renewable energy and waste management solutions across Western Europe poses a significant threat to Russia's reliance on hydrocarbon revenues. As Bouzarovski and Bassin (2011) have shown, the discourse of Russia as a great power is connected to energy production and energy geopolitics.

Lithuania, Latvia, and Estonia, the post-Soviet states that have joined the European Union, are among those to have already met, or are close to meeting, the 2020 European renewable energy targets. Three-quarters of Georgia's domestic energy production comes from hydro and biofuels/waste sources, and the country's share of renewable sources in its energy portfolio is among the world's highest (74.7 percent in 2020) ("Georgia Energy Profile" 2021). In these places, as well as in other post-Soviet countries, such as Ukraine, Armenia, and Kazakhstan, the green movements of the late Soviet period became a rallying point for reviving and politicizing national identity. Protests over the nuclear pollution at Chornobyl and Semipalatinsk, as well as such state plans as expanding the nuclear

1 Sakhalin-2 exports liquified natural gas and oil to the Asia-Pacific markets.

plant in Ignalina and building an aluminum plant in Yerevan, became equated with a desire for independence (Dawson 1996). In Kazakhstan, nuclear disarmament coincided and is often equated with a break from Soviet political control, as well as an influx of international financial aid meant to help combat the effects of radiation and nuclear pollution. Additionally, most Central Asian states advertise their willingness to support the development of renewable energy resources as a means to attract foreign investors ("Share of Renewable" 2022; Cohen 2021).

However, many of the post-Soviet states, as well as most European Union members, are still energy dependent on Russia. In Georgia, for example, natural gas and oil still make up nearly 70 percent of the country's total national energy usage ("Georgia Energy Profile" 2021). Russia's control of fuel exports has led in some cases to environmental regression, for instance Germany's June 2022 decision to burn more coal in an effort to free itself from dependence on Russian natural gas. The need for cheap energy, combined with fears of a nuclear world war, has sparked a global nuclear renaissance (Nuttal 2004; Stulberg & Fuhrmann 2013). Several European Union states, as well as the United Kingdom, are considering revitalizing their nuclear energy sector (Ro 2022). With Russia's help, Kazakhstan and Kyrgyzstan are considering building new nuclear plants to compensate for increased energy needs ("Kyrgyzstan Mulls Building" 2022; "Kazakhstan Likely to" 2022). Likewise, in Russia, the Rosatom agency has undertaken a long-term cultural campaign that presents nuclear power as a heroic Soviet achievement and a tenet of contemporary Russian national identity (Rindzevičiūtė 2022). These diverse circumstances and conflicting attitudes within the post-Soviet world vis-à-vis the energy sector further exacerbate the existing economic and political tensions and inequalities between Russia and its neighbors. In this volume, the issue of the Soviet Union's and now Russia's exploitative relationship with its Central Asian periphery is examined by Elena Monastireva-Ansdell.

Paradoxically, by its very nature, environmental criticism is both easy and challenging to adapt to non-Western contexts. Certain concepts, such as energy and waste, are general enough to exist on their own in a shared Eurasian-American cultural space. In fact, Lawrence Buell argues that "the environmental turn in literary studies has been more issue-driven than method or paradigm-driven," which facilitates an ecocritical reading of non-Western literature and film (Buell 2005, 11). At the same time, the genealogy of environmental studies is markedly

different across the globe, endowing ideas about nature, humanism, and the environment with a range of different connotations. For example, the concept of sustainable development and management of resources has been a critical issue in most contemporary Western societies since the mid-1950s. However, much of the environmental public discourse and academic debates in the West remain unacknowledged in Russophone cultural production. The most comprehensive work on conceptualizing and framing the environment during the imperial Russian and Soviet periods has been done by (social) scientists rather than by writers, artists, or scholars in the humanities (Graybill 2007). Moreover, to date no comprehensive study has investigated specifically the relationship between energy and waste in the cultural sphere, nor the way that these categories are made visible for average citizens through literature, film, art, and other modes of cultural production.

While most area studies in Western academia have gradually turned their attention towards ecological and environmental themes, this process has been particularly slow in catching on within Slavic and (post-)Soviet studies. Most of the work on environmental theory and themes done by scholars of Russia and the (post-)socialist world is focused on conceptualizing and contextualizing the Anthropocene, as well as decentering the human experience. Of particular note is Jane Costlow's pioneering work, including her monograph, *Heart-Pine Russia* (2013), as well as the volumes *Other Animals: Beyond the Human in Russian Culture and History* (2010), co-edited with Amy Nelson, and *Water in Social Imagination* (2017), co-edited with Yrjö Haila and Arja Rosenholm. Other notable examples include the volume *The Human Reimagined: Posthumanism in Russia* (2018), edited by Colleen McQuillen and Julia Vaingurt, as well as the special issues of *Russian Literature*, edited by Alec Brookes and Elena Fratto, *Towards a Russian Literature of the Anthropocene* (2020). There is a notable absence of a more diverse approach to environmental themes, as well as engagement with alternative theoretical frameworks that could help contextualize eco narratives in (post-)Soviet cultural production.

*Book Structure*

This volume is comprised of eight chapters divided into three sections. The first section, *Making Energy/Waste Visible,* focuses on the ways that energy and waste can be rendered visible in their complex interrelationship, and explores their political and politicizing nature.

"Regimes and Their Refuse: Filming Russia in Transition" by Masha Shpolberg uses film, both documentary and fictional, to examine the late-Soviet and post-Soviet Russian preoccupation with landfills and garbage. The chapter considers a wide range of works from different parts of the world, but focuses specifically on Hanna Polak's *Something Better to Come,* El'dar Riazanov's *Promised Heaven,* and Roman Prygunov's *Soulless.* The author argues that filmmakers were drawn to the garbage dump during transitional moments, as a peripheral space from which to reframe major political and economic shifts at the center. Drawing on the work of Julia Kristeva, Martha Nussbaum, John Scanlan, and Zygmunt Bauman, the chapter examines how the concept of waste was extended to include all those left behind by these changes, and how the process of so-called social progress is predicated on social exclusion. The chapter concludes by considering the unique tools cinema possesses for countering the politics of suppression and disgust, particularly through sustained attention, carefully chosen framing, and sound design. From these films the vision of the dump that emerges is of an ambivalent space, at once a kind of "zone" outside of history and a flatter, more open and democratic foil to the increasing verticality and hierarchies of the new, capitalist Russia.

An in-depth look at waste visualization strategies is found in "'Pomor'e ne pomoika': Framing the Protest Campaign against the Landfill Project at Shies Station in Russia's Arkhangelsk Region" by Elena Gorbacheva. The chapter focuses on the 2018–2020 protests against the construction of the Shies landfill for waste from Moscow in the Arkhangelsk region, which gained support nationwide. The author probes which narrative and framing strategies of the Shies protest organizers were most successful in making their ecological concerns visible in a way that transformed their concerns from a local to a national problem. The protest, which started as a campaign against locally unwanted land use, highlighted existing environmental injustice in Russia and anti-center resentment in the regions.

The three articles in the second section, *Reassessing Soviet Legacies*, focus on how waste and pollution are reframed as sociopolitical symbols of post-Soviet transition. The first article, "Post-Soviet Cinematic Depictions of the Semipalatinsk Nuclear Test" by Maria Hristova, focuses on nuclear testing and its consequences as imagined in three post-Soviet films. All three films—*Leila's Prayer* by Satybaldy Narymbetov, *A Gift for*

*Stalin* by Rustem Abdrashev, and *The Test* by Aleksandr Kott—show the devastating effects of atomic bombs on the surrounding world. However, the environmental turn in post-Soviet cinema is gradually shifting from an ecological focus on the global impact of radiation to more politicized and anthropocentric depictions of atomic testing.

"Environmental Contamination and Postcolonial Recuperation in Late Soviet and Post-independence Kazakh Cinema" by Elena Monastireva-Ansdell traces the development of the Kazakh ethno-national idea from the late Soviet to the contemporary period through the representation of ethnicity and landscapes in film. The chapter examines the changing perceptions of large-scale Soviet projects and the resulting environmental problems depicted in Rashid Nugmanov's *The Needle* and Rustem Abdrashev's *Renaissance Island* through the lens of postcolonial studies.

"The Politics and Aesthetics of Waste in Liudmila Petrushevskaia's Fiction" by Irina Anisimova picks up the metaphor of waste, exploring its significance and transformation in Petrushevskaia's prose of the late and post-Soviet periods. The chapter argues that this evolution of waste imagery is symptomatic of both the changes in Petrushevskaia's fiction and the sociocultural trends of late Soviet and post-Soviet society. In Petrushevskaia's earlier fiction, the metaphors of waste often express a social critique of Soviet life; in her later works, they acquire a democratizing function, while simultaneously losing the critical sociopolitical stance of the author's Soviet-era fiction.

The third section, *The Chornobyl Disaster*, narrows the volume's focus to the significance of the nuclear catastrophe. "Finding Our Words: Representations of Chornobyl and the Impossibility of Language" by José Vergara uses the concept of a "hyperobject" to probe the crisis of language affecting the post-Chornobyl world, and the range of strategies adopted by writers and directors to express the invisible devastation of nuclear contamination.

"A Terrible Kaleidoscope: The Anthropocene Lyric in Chornobyl Poetry" by Haley Laurila focuses on Ukrainian poetry both from before and after the reactor explosion. Poets like Ivan Drach, Lina Kostenko, and Oksana Zabuzhko pioneered strategies of contextualizing the Chornobyl environmental disaster as part of a wider anthropocenic moment before the term "Anthropocene" gained traction in academic circles.

Finally, "The Unknowability of Post-nuclear Landscapes in the Russian Television Series *Chernobyl, Exclusion Zone*" by Irina Souch ex-

plores the limits of humans' ability to comprehend the consequences of the Chornobyl disaster. Focusing on the Exclusion Zone's contaminated landscapes,[2] the chapter engages with the existing visual vocabulary for depicting Chornobyl, in order to demonstrate how it evolves as a binary opposition: the contaminated area is usually depicted as a locus of either human abandonment or nature's vengeful return. The chapter further demonstrates how the series problematizes familiar historical accounts and artistic representations. By rearranging them in accordance with sci-fi aesthetics, the series seeks to render intelligible the effects of radioactive fallout, which often go beyond the boundaries of human perception.

*Conclusion*

This volume takes a step towards nuancing and enriching environmental approaches in scholarship on the post-Soviet world. Admittedly a contested term, the "post-Soviet" in the title of this book refers to the continued existence of shared physical infrastructures and non-material relationships between the states that used to be part of the Soviet Union. By necessity, the volume is interdisciplinary, exploring and opening up venues of analysis both for teaching the environment in the contemporary classroom and conducting further research on this topic.

While the project was conceived before Russia's invasion of Ukraine, current events highlight the urgency of reconceptualizing the links between energy and waste in post-Soviet space, as the conflict both threatens and emphasizes the Soviet-era infrastructures of energy/waste that still inextricably connect the region. In the fall of 2022, as we completed work on this volume, Russian military forces bombarded Ukraine's power grid, including threatening the security of the Soviet-era Chornobyl and Zaporizhzhia nuclear stations. Ukraine's power grid crosses post-Soviet borders, meaning that outages can lead to blackouts in neighboring Moldova. At the same time, previous environmental stresses have not disappeared. For example, while the war led to a temporary stop to environmental protests in Russia, the Federation's aging Soviet-era infrastructure is likely to lead to new environmental catastrophes and protests. These are possible directions to be taken by future environmental research on the region, and we hope that our project will be an important contribution to such studies.

2 The contaminated area around Chornobyl is termed an exclusion zone.

*Acknowledgements*
This volume began as a stream of environment-themed panels at the ASEEES Convention in 2020. Since then, many people helped to bring this project to its completion. We would like to express our sincere gratitude to the University of Bergen's Department of Foreign Languages and the Graves award for the Humanities (awarded to Lewis & Clark College) for financial support. We also would like to thank Anatoly Pinsky for his meticulous copyediting and Ingunn Lunde for including the volume in the Slavica Bergensia series. We are grateful to the external peer-reviewers for their timely responses and constructive criticism and to all contributors for their unwavering enthusiasm for this project.

*Note on Transliteration and Names*
We use the Library of Congress system of transliteration for non-English words and names. This includes proper names that are more widely known in alternative spellings, such as Petrushevskaia (Petrushevskaya) and El'tsin (Yeltsin). In instances where an individual's preferred spelling of their names is known, we opt to use that version. For place names, we use the current popular spellings preferred by the country in which the places are located, unless discussing primary sources or secondary materials that use the older Soviet spelling. This means, for instance, that while we use the Ukrainian spelling "Chornobyl" predominantly in the text, we use "Chernobyl" when referencing Soviet-era publications and also when discussing the disaster in Russian context: for instance, in Irina Souch's chapter on the Russian TV series *Chernobyl, Exclusion Zone*.

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