

❖ Relating photography to the concept of energy easily slips into thinking about the footprint, hidden costs, and environmental impact of producing and consuming photographic images. I often find myself asking what standards justify doing photography, or art, today. But such a general and admittedly blunt question no doubt risks having a stultifying effect, at best. Instead, looking at the way we speak about energy might actually tell us something about how we formulate our self-interrogations and illuminate some of the historical predispositions of much of photography. One might also wonder what photography, in turn, can teach us about our idea of energy. And how, if at all, and in whatever way or form, photography might help us reconsider some of the prevailing connotations that swirl around the term, often dominated by a logic of efficiency and growth that is not above suspicion when it comes to environmental ruin.

To probe these and other possible associations between energy and photography, I met with Hannah Fletcher, photographic artist and co-director of The Sustainable Darkroom; Hiroki Shin, social and cultural historian of energy at Queen's University of Belfast; and Cara Daggett, associate professor in the Department of Political Science at Virginia Tech, where she researches feminist political ecology.

In preparing the roundtable, I was somewhat taken by surprise to learn that one common scientific definition of energy, at least in physics, is 'the ability to do work'. But upon second thought, it does seem to make a lot of sense. If I run out of energy, I won't be able to write this article. I should maybe eat something or take a break to replenish my energy reserves. If my laptop's battery runs low, I have to charge it. We need energy for things to function properly and to work well.

When I bring this up at the beginning of our conversation, Daggett immediately interjects that energy as the ability to do work is really only an engineer's definition. And what's more, she adds, it's self-contradictory. The science itself challenges it. 'The first law of thermodynamics says energy is conserved and cannot be created or destroyed', she notes. Energy is merely transferred from one place or form to another, and this happens everywhere all the time, for instance, by providing light late at night or heating up water for another coffee. 'However, the second law of thermodynamics is about the concept of entropy, which essentially says that things tend to fall apart and that energy tends to diffuse into forms that are less able to do work. This tells us that energy means something more than work. When entropy increases, the amount of energy stays the same, but it is energy that does less, or maybe even no, work.'

Violating the law of noncontradiction or not, when we use the word in a day-to-day situation, there seems to exist little confusion as to what is meant. In my life, connotations tend to oscillate between bills to pay, lessening consumption, feeling worn out or energetic. And fuel, which is

Finding Abundance in Waste

In conversation with Hannah Fletcher, Hiroki Shin and Cara Daggett

Bas Blaasse

¹⁰⁷ A noteworthy fact was brought to my attention by Boaz Levin, author and curator of the exhibition and book *Mining Photography* (Spector Books, 2022). During a talk he gave in April 2023 at the Royal Academy of Fine Arts in Antwerp as part of *Hydromediac Seeing with Water*, organised by the academy in collaboration with the HKU University of the Arts Utrecht and the Karlsruhe University of Arts and Design, Levin pointed out that one of the earliest pioneers of photography, Joseph Nicéphore Niépce, was simultaneously working with his brother Claude Niépce on the early development of the internal combustion engine.

less often than I'd like about renewables. 'As an energy historian', Shin responds, 'I have indeed thought about energy mostly in terms of fuel, and thus about energy consumption. Even though, as Cara [Daggett] outlined, energy consumption is not the right way of using the term, as energy cannot be consumed or wasted. Nonetheless, at least since the mid-twentieth century, we've been talking about energy consumption.'

If the meaning of energy largely depends on context and application, where does that leave practising photography? 'Energy is really an epistemology', Daggett adds. 'It's a way to understand the world.' Taken as a paradigm, 'energy' might not be all that different from visual media in how it heavily bears on our interaction with our environment. It's a lens. It enables us to see, and to see in a particular way. And that, of course, means things could be different. Hard as it may be to imagine, there was a time before we spoke about energy as we do today, just as there was a time before photography. What's more interesting still is that energy was 'discovered' around the same time as photography, which is no coincidence, seeing how both are embedded in the chronicle of industrialisation.¹⁰⁷

It's almost a modern tale about siblings. Modern, because they're caught up in promoting a world of efficiency, productivity, and profit. At first glance, that might not be obvious. Not in the least, because as Fletcher notes, 'photography is making something visible, whereas energy is not visible.' But similar to early photographic experiments that were aimed at a better understanding of bodily movement, which then further enticed the development of photographic techniques, the concept of energy was conducive to the advancement of scientific knowledge. 'The concept was proposed', Daggett explains, 'in the context of trying to figure out how steam engines work and how to make them more efficient.' Each in their own way, photography and the science of energy equally contributed to the relentless quest to unravel the mechanisms of an increasingly rationalised world, by providing ever-greater access to reality on the far side of sensorial comprehension. 'It's a move towards visualizing things that can't otherwise be sensed by humans, in ways that can be useful', Daggett concludes.

With that in mind, taking seriously photography's role today means more than just acknowledging what the production of photography 'consumes'. It entails paying attention to the customs that are in place and the language that is used, and realizing where the attitudes and principles of doing photography in a certain way originate from so they won't end up becoming mere dogma.

Fletcher introduces herself as a photographic artist and someone who rarely uses a camera. 'I find that the camera can be a barrier for me, it prevents me from physically touching and interacting with our environment.' Instead, she brings a lot of natural material into the darkroom, whether it's earth, mushrooms, or algae, or she creates photographic works using photosynthesis.





Hannah Fletcher and Alice Cazenave, from the series *Made by Many Hands*, 2020.

Made by Many Hands (2020) manipulates the photosynthesis on a leaf to generate an image. 'It's just the chemistry of leaves, a process of allowing areas of the leaf to become oversaturated with light until there's a pigment shift. It's tapping into those kinds of "natural images" and thinking about how images already exist in nature and how we can work with them.'

Working predominantly with analogue processes, Fletcher explores environmentally friendly ways of using them. For her, sustainability goes beyond the use of photographic materials. 'It's about everything we do, from how we teach to how we source things and put content out there.' Alongside her personal practice and much in line with her research interests, Fletcher co-directs an organization called The Sustainable Darkroom together with artists Alice Cazenave and Edd Carr. The artist-run research and training program does what its name suggests. According to their solar-powered website, they aim to foster knowledge about using the darkroom in thoughtful and environment-friendly ways. 'It's really broad reaching', Fletcher says. 'We teach workshops about anything from ideas around low-power digital photography and permacomputing [a more sustainable approach to computer and network technology inspired by permaculture], all the way to making your own chemistry from plants. We'd like to re-address as much as we can within the photographic industry.'

That starts with rethinking the entire photographic process. Working in the darkroom, at least traditionally, involves using a lot of chemicals. But the methods, Fletcher explains, are often not based on factual knowledge but rather on dogmatic beliefs and habit. 'To make darkroom work more ecologically responsible, we try to understand the basics. A lot of our research goes back to historical papers from the eighteenth century, before the use of cameras and photography was simply using light – for example, to find the minimum amount of water necessary to wash photographic prints or film.'

But changing and moving an entire industry requires the efforts of many. In addition to his research as a historian, Shin works in the field of science communication, mainly in the museum sector. There, he's thinking about 'cultural decarbonisation'. And that doesn't just mean thinking about how culture can reduce or eliminate carbon emissions, whether at the level of production, supply chain, or infrastructure. 'It's also about content and how culture can actually accelerate the decarbonisation of society. Which is tricky, because you have the problem of greenwashing and the risk of culture becoming a didactic tool that limits artistic freedom. Nevertheless, if our existing culture is deeply intertwined with the value of an energy-intensive civilisation, then those who remain silent on energy and climate issues may inadvertently be helping to extend the shelf-life of the current energy regime.'

One of Shin's key interests is the idea of the energy crisis. How has energy come to define our

worldview, and how is it possible that energy scarcity becomes a threat to the humanities?

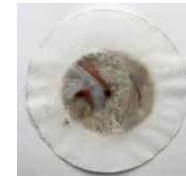
To Shin, it's obvious that we can't solely rely on the promise of technological innovations to transform our energy system. We will need to address the bigger picture and reduce our demand for energy. Shin emphasises that throughout the twentieth century, a kind of technological utopianism reinforced boundless optimism about future energy supplies, leading to what he calls techno-utopian inertia. According to Shin, the problem is not the optimism itself but its effect. Excessive reliance on technological fixes might distract us from other, perhaps more challenging, changes that go to the heart of our capitalist culture.

It might not come as a total surprise that one such change involves reconsidering our commitment to endless growth. This is what Daggett argued for in her 2019 book, *The Birth of Energy: Fossil Fuels, Thermodynamics, and the Politics of Work*, in which she takes issue with the premise of mass consumption and intensive energy use as necessary preconditions for improved living standards and quality of life.¹⁰⁸ As Daggett explains, while many people still require more energy within our current global systems, there is a limit to how much energy use can further enhance our well-being. 'Beyond a certain point, well-being tends to plateau as energy consumption rises.'

We are led to believe that we need ever more. Daggett reminds us that a great deal of money and effort has gone and still goes into creating demand for energy and mass consumerism, and into structuring everyday life to facilitate those demands. Shin adds that 'one striking aspect of the history of energy is that policymakers, energy experts, and businesspeople have all operated on the idea that future generations would demand a greater amount of energy.' But that's not a pre-existing demand. The assumption that demands for energy will forever continue to rise leads to a feedback loop where increased supply encourages even more consumption.

The question is how to break that hegemonic circle of a model built around growth. For Daggett, it needs to start with recognizing the mismatch between community needs and how energy is extracted and supplied. But there is also the more difficult problem of desire, she adds. 'We've learned to rely on enjoying aspects of mass consumerism. Even if these desires are socially and historically constructed, they are real.' Daggett brings to mind an installation by Jenny Holzer from 1982 that aptly captured the absurdity of the problem. Consisting of a sign with big neon letters, it read, 'Protect me from what I want.'

If we want to shift our attention away from this kind of incomplete desire and longing for abundance and the creation of new goods, how can we use a medium that's expected to produce things?¹⁰⁹ At the time of our conversation, Fletcher mentions that The Sustainable Darkroom is hosting a workshop on how to cultivate a



Hannah Fletcher, *Oat Milk That Went Off In The Studio*, from the series *An Anthology of Studio Waste*, 2023.

low-waste studio practice. 'Ideally, we're working towards a zero-waste studio practice, but that's incredibly hard as you are, in fact, putting stuff out there. So, we're thinking about how we can reduce our waste as makers, but also how waste can become a site for something new, how we can reuse our waste within the practice of a darkroom.'

An easy way to start redirecting our gaze is by looking at what's already there. But the wish to reduce and manage waste as efficiently as possible comes with an interesting caveat. In her research, Daggett found that energy science has historically been tightly bound up with a veneration of capitalist work and efficiency, and thus with managing waste. The energy transformation, she argues, requires re-evaluating that bond too. 'That means abandoning the idea that Westerners have a sacred project to put the world to work, and asking questions about the purposes of working activity, how it is distributed and rewarded.' And that questioning of work, she explains, 'will also come with deep suspicion about how waste is treated.'

While acknowledging that minimizing waste is important, Daggett wants us to question the need to discipline all activities in society. 'The urge to limit waste and become maximally efficient', she explains, 'can function as the mirror image of the culture of work and energy intensification. Waste is a human category.' In her view, we should be apprehensive of a too single-minded, puritan-like focus on *less*. 'Instead, it might be more helpful politically and aesthetically to also think about where abundance can appear, and where a sense of play, excess, and *more* can show up. Too often, environmentalists are put into the corner of sacrifice and asceticism only.'

Recently, Fletcher says, she's been working with a degrading waste chemistry as a form of paint or ink. Using a photographic developer, water from washing cyanotypes, and silver sulphide from an exhausted photographic fixer, she creates pictures that move between the visual effect of ink drawings, microscopic imagery, and a distorted aerial view of the earth. Endless new photographic image openings surface from what would otherwise have been discarded.

And it is this idea of seeing potential in excess and leftovers that she continues to explore in a body of work called *An Anthology of Waste*. 'I see everything that comes out of my studio, every material, as a starting point for making something new and an opportunity for image making rather than a negative endpoint. From tea that I spilt on my desk to water from washing oak galls or the liquid left from growing kombucha.' She uses a laboratory technique called chromatography, which is used for the separation of a mixture into its components – a form of dissolution that doesn't exactly strike me as photographic in nature. Prior to our virtual get-together, I googled the term and found nothing but images of graphs and chemistry tubes and those cylindrical-shaped containers used to hold reagents or samples. But in her case, Fletcher explains,

¹⁰⁸ See Cara New Daggett, *The Birth of Energy: Fossil Fuels, Thermodynamics and the Politics of Work* (Duke University Press, 2019).

¹⁰⁹ I am paraphrasing Todd McGowan, who in *Capitalism and Desire* (Columbia University Press, 2016) calls this kind of artificial desire fed by capitalism 'incomplete satisfaction'. It refers to the sense of perpetually lacking something – the perpetual lack without which the imperative of an upward-sloping graph seems inconceivable and which, reinforced by scarcity, fuels life under capitalism.

'it's using light to show a material reaction. It visualises all of the components and minerals held within a solution. I combine silver nitrate in the chromatography process, and the sensitivity of the silver nitrate to both light and organic matter is what makes the components visible to the human eye. For instance, some milk went off in my studio, and through the process of chromatography, it becomes a photographic representation of it.'

For Fletcher, it's about rethinking what materials are and what waste is. 'I really want to question the terminology of waste. Maybe we don't even need the word in our vocabulary. Maybe we shouldn't label anything as waste but just as what it is. If we're taking used coffee grounds, we call it used coffee grounds.'

Thinking differently about leftovers and unused or 'useless' material – that is, thinking of them not as waste but merely as what they are with the potential of becoming something new – is still different from thinking of art as abundance. But then again, perhaps not so different. Fletcher's experiments with 'photographic' techniques and processes and her integration of non-artistic means into her practice as an artist already suggest conceiving of analogue photography more broadly than tradition prescribes. Beyond simply reflecting on the materials used, it really comes down to thinking about new methods. Fletcher's collaborations with organic matter in the darkroom allow the parameters of the darkroom to fade, as it were, into their own obscurity. It's a way of enabling unfamiliar scores and unforeseen wirings to emerge, expanding the idea of what a photograph is.

And that implies engaging with questions about what counts as art and photography. Daggett suggests we take inspiration from Kristin Ross' *Communal Luxury: The Political Imaginary of the Paris Commune*. Writing about the role that art played for the revolutionaries of the Paris Commune in the late nineteenth century, Ross talks about the 'transvaluation of the very idea of art and abundance'.¹¹⁰ Daggett projects that instead of a specialised endeavour serving only a small privileged class, art could become 'an everyday ethos that orients one's activities, from how gardens are tended, how streets could become orchards, or maybe how the government is organised too.'

Where to look to ease the beat of harder, better, faster, stronger? What is the first step in eschewing a logic of growth and efficiency that's so effective in painting waste as wasteful? Can we afford ourselves the privilege of sidestepping the binary of either technology – or ascetic-based answers to questions about energy transition? Or is this question already an expression of a particular disposition? And does the very form itself indicate how much it's actually indebted to how we tend to approach things? How do you challenge terminology when it's so ingrained in your way of seeing? In a follow-up email, Fletcher left us with a poignant question: 'If a photographic image is never seen, is it a waste of energy?'

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¹¹⁰ Kristin Ross, *Communal Luxury: The Political Imaginary of the Paris Commune* (Verso Books, 2019), 64.

Mariama Attah is a photography curator, writer and lecturer with a particular interest in overlooked visual histories and understanding of how to use photography and visual culture to amplify underrepresented voices. Currently Associate Curator at Deutsche Börse in Frankfurt am Main, Attah's previous roles included Head of Exhibitions at Open Eye Gallery, Liverpool, UK; Assistant Editor of *Foam Magazine*; Curator at Photoworks and Commissioning and Managing Editor of the yearly magazine *Photoworks Annual*.

Eline Benjaminsen's work deals with the challenge of perceiving market processes through photographic follow-the-money narratives that combine prints, video and text in mixed media installations. Concerned by how socio-economic processes' lack of visibility affects our ability to engage them, her projects investigate the potentiality of imagery to enable us to observe such processes clearer. She collaborates with a variety of platforms and individuals from researchers, activists and economists to the financial press and museums. She has recently exhibited her work at the Tropenmuseum, Amsterdam, NL; Mannheim Biennale für Aktuelle Fotografie, Mannheim, DE; Atelier Néerlandais, Lille, FR and Centre National de l'Audiovisuel, Dordrecht, LU.

Sylvia Ballhouse was born in Halle (Saale), DE. After a graphic-design apprenticeship, she graduated in communications design with a focus on photography in Darmstadt, DE, in 2002. From 2007 to 2011 she studied at the Hochschule für Grafik und Buchkunst – the Academy of Visual Arts Leipzig, DE, with Christopher Müller and Beate Güntchow (class of artistic photography). Ballhouse has taken part in several group exhibitions and international photo festivals. From 2013 to 2017 she worked at Zephyr – Raum für Fotografie in Mannheim, DE. In 2018, she managed Darmstadt Days of Photography. Since 2018, she has been working as project manager at Kehrer Verlag Heidelberg. She has taken part in several group exhibitions and international photo festivals.

Bas Blaasse writes about contemporary art and visual culture. Occasionally, he writes fiction and works with sound and moving image. He studied philosophy and photography and is online editor at GLEAN. Bas is the recipient of the C/O Berlin Talent Award 2023 – Theorie. He works between Brussels and Rotterdam.

Cara Daggett is an associate professor of political science in the Department of Political Science at Virginia Tech. Her research explores the politics of energy and the environment in an era of planetary disruption. She is interested in questions that lie at the nexus of human well-being, science, technology and the more-than-human world. Her work often draws upon feminist approaches to power in order to understand how global warming emerged, as well as how it might be mitigated. Daggett's book *The Birth of Energy: Fossil Fuels, Thermodynamics, and the Politics of Work* (Duke, 2019) was awarded the Clay Morgan Award for best book in environmental political theory.

Matej Dobokay, born in Pécs (HU), lives and works in Budapest (HU). His body of conceptual artworks pushes the boundaries of photography: they uncover the inner structures, raw materials, chemical and physical components of photography, often without

a camera and as a result of lengthy research experimentation. In his analytical pieces, the paper, the photographic substances and the chemical reactions all serve as tools of artistic examination. In his artistic practice, Dobokay explores the materiality of photography through abstract images, which are expressions of his investigations into the structure of photo paper and the chemical image development processes.

Tanja Engelberts, born in Deventer (NL), lives and works in Den Haag (NL). Engelberts has worked on several projects related to the fossil fuel industry. In 2021, she concluded a two-year residency at Amsterdam's Rijksakademie. She has participated in further residency programmes at The Banff Center for Arts and Creativity, Banff, CA; The Ucross Foundation, Clearmont, US; IK Foundation, NL and Öró Residence, Öró, FI. Having exhibited and published internationally, Engelberts' art is included in the collections of De Nederlandsche Bank, NL; De Brauw, NL and Clifford Chance, UK. Her first photobook *Forgotten Seas* was published in 2023 by The Eriskay Connection. She is represented by Caroline O'Brien Gallery, Amsterdam, NL.

Tina Farifteh is an Iranian-Dutch visual artist whose work is poised at the intersection of art, politics and philosophy. Her particular interest lies in what makes us human and how human life can become a plaything for politics. Farifteh's work reflects on how power structures impact the lives of ordinary people. She wants to tempt us into looking at subjects that we would rather avoid because they are complicated or uncomfortable. Farifteh holds a Bachelor's degree from the Royal Academy of Art, Den Haag, NL and a Master's from the Erasmus University in Rotterdam, NL.

Hannah Fletcher is an artist who works with cameraless photographic processes and founded The Sustainable Darkroom. She is also co-director of London Alternative Photography Collective and a facilitator of sustainability within the arts. Fletcher works with and researches the many intricate relationships between photographic and not-so-photographic materials. To this end, she intertwines organic matter such as soils, algae, mushrooms and roots into photographic mediums and surfaces. Fletcher questions the life cycle and value of materials by incorporating waste from her studio and workshops back into the system of making. Working in an investigative, ritualistic and environmentally conscious manner, she combines scientific techniques with photographic processes, creating dialogues and fusions between the poetic and political.

Cale Garrido is a Spanish journalist, curator and photo editor with a focus on contemporary photography. Based in Hamburg, DE, she collaborates internationally with artists, collectives, art institutions, festivals and galleries. She was a curatorial team member of the 8th Triennial of Photography Hamburg in 2022 and the RAW Photo Triennale Worswede in 2023. Although she works on exhibitions and publications, Garrido's main interest lies in addressing social and ecological issues. She is a guest lecturer at the University of Applied Sciences and Arts in Hanover, DE.

Risk Hazekamp (pronouns: they/them) is a Dutch interdependent visual artist, researcher and arts educator. Their work revolves

around the complex and constantly changing relationship between bodies and images. Questions emerging from the theme of gender were later applied to other socio-political issues, both human and more-than-human. Risk's practice is project-based and consists of analogue (currently micro-organic) photographic thinking processes to change existing systems. Since 2020, they have been a researcher at the Research Group for Biobased Art & Design at Avans University, NL where as of 2023, Risk started their Professional Doctorate titled: 'Unlearning Photography: Listening to Cyanobacteria'.

Hiên Hoàng is a multimedia artist from Vietnam currently living in Hamburg, DE. She holds a master's degree in photography and design from HAW Hamburg, DE. Her artistic repertoire includes photography, installation, performance, film, VR and object art. Hoàng's work explores social values, the transformation of materials and the complex interplay of identity through self-intervention. Recently, she has been collaborating with scientists at the intersection of art and science, which challenges human perception (e.g. *Made in Rice*). With each creation, whether photography, installation, immersive VR or tangible objects, Hoàng invites viewers on a transformative journey that pushes the boundaries of perceptions.

Euridice Zaituna Kala is a Mozambican artist-teacher, whose work focuses on cultural and historical metamorphoses, manipulations and adaptations. She reproduces the visual vocabulary of historical archives to reveal their subjectivities, but especially those of people who are invisible. Kala questions the appropriation of black [narratives] bodies through their representation within archives. Rather than capturing their history, her work attempts to reaffirm their existence. Kala is interested in contemporary art based on artistic research with an expression in plural forms, a practice that presents itself as interdisciplinary and protean (performances, installations, photographs, texts, videos, sculptures/landscapes, sound works...) Kala is a graduate in experimental photography from the Market Photo Workshop, Johannesburg, ZA in 2012 and from the Asiko School in Maputo, MZ in 2015.

Sebastian Koudijzer studied at the Royal Academy of Art in Den Haag, NL, Growing up as a child of different races – and surrounded by a large extended family on his Javanese side – he is interested in how identities are created. Using various techniques, he creates intimate stories that address themes of family, faith, identity and their representations. Collaboration plays an important role in his projects, since Koudijzer likes to give those he photographs a space for their own voice. His work is an attempt to bring disappearing traditions, values and spirituality back into his own reality, with the camera becoming an exploratory tool.

Sheng-Wen Lo was born in Kaohsiung (TW) and lives and works in Leiden, NL. His works investigate the relationships between nonhumans and contemporary society through a range of media including images, installations and games. An alumnus of the Rijksakademie, Amsterdam, Lo's works have been shown at Foam and World Press Photo, NL; International Center of Photography, US; MCCA, Seoul, SK; The National Gallery of Victoria, Melbourne, AU; and the Taiwan Biennial, Taipei, TW. He was selected as a