Oleksiy Radynski

Is Data the New Gas?

1.

In Brussels on May 1, 2019, Rick Perry, then-US energy secretary, announced that "seventy-five years after liberating Europe from Nazi Germany occupation, the United States was again delivering a form of freedom to the European continent." And, in the twenty-first century, he added, "rather than in the form of young American soldiers, it's in the form of liquefied natural gas."[1] Perry was referring to a deal that would double the size of US gas exports to Europe. But from what, exactly, would Perry's "freedom gas" liberate Europe?

Perry's colorful statement came as an explicit snub to the Nord Stream 2 gas pipeline, a project that Russia and Germany have been pursuing since the 2010s to link the two countries directly via the Baltic seabed. The pipeline's route bypasses intermediary countries like Ukraine, whose state budget depends heavily on gas transit revenues. Nord Stream 2 is expected to double the capacity of the already existing Nord Stream pipeline, increasing the volume of transmitted gas up to 110 billion cubic meters a year. Into 2020, Merkel's government continues to defend this massive gas infrastructure project that's been mired in controversy from the start.

Strangely enough, most of the criticism facing the Nord Stream 2 project comes from a geopolitical, rather than an ecological, perspective.[2] Its critics say that this pipeline would disproportionately increase the EU's dependence on Russian fossil fuel exports.[3] It's also quite clear that the actual political rationale for this project is to render obsolete the subterranean, Soviet-era natural gas arteries that run through large parts of the European continent that are no longer under Russia's control. Following Russia's invasion and annexation of Ukrainian territories in 2014, Merkel's government's adherence to the Nord Stream 2 project did not cease to raise eyebrows.[4] After the downing of a passenger plane over the Donbass in July 2014 by pro-Russian proxies, the ensuing sanctions against Russia did not affect the project in any way. In German public debate, the fact that the completion of Nord Stream 2 would likely cause the economy of Ukraine to collapse, a country at war with Russia, has been constantly referenced – but to little avail.[5]

The intricacies of the ongoing Nord Stream 2 debate, however, miss a rather large elephant in the room. Without questioning the importance of countering Russia's neocolonial wars in Ukraine and elsewhere, it is easy to see why the biggest problem with the new pipeline is not at all the fact that it will deprive Russia's neighbors of their transit revenues. Such revenues, in fact,

Smiley-face graffiti on a gas pipe at the Nord Stream 2 construction site in Lubmin, Germany. Copyright: Nord Stream 2 / Axel Schmidt.

Gerhard Schröder, ex-chancellor of Germany and chairman of the board of directors of Nord Stream 2, and Matthias Warnig, former member of the Stasi and CEO of Nord Stream 2. Copyright: Nord Stream 2 / Wolfram Scheible.

fuel gross corruption schemes, like those that define Ukraine's political process, and guarantee the concentration of exorbitant wealth in the hands of oligarchs.[6] Nor is the biggest problem the fact that Nord Stream 2 will provide the Russian autocratic elite with another powerful tool to subvert European politics. The real problem is that this tool, just like its countless counterparts, undermines the future of planet Earth by bringing the irreversibility of climate change one large step closer. And this time, placing the blame squarely on Russia is clearly not an option.

With Germany's ex-chancellor Gerhard Schroeder as a manager, and Mathias Warnig (an ex-Stasi officer with a long-standing connection to Vladimir Putin) serving as the CEO of the project, it is not surprising that the German government values its Nord Stream 2 commitment more than its widely anticipated green transition. In a truly Orwellian move, Nord Stream 2 presents itself as an environmentally friendly initiative that will help decrease carbon emissions from oil and coal, fossil fuels that are, it is claimed, much dirtier than natural gas. This argument is refuted by ecologists who assert that, despite being relatively "cleaner" than much of the existing carbon infrastructure, projects like Nord Stream 2 would increase the structural, long-term dependency on fossil fuels to such an extent that a transition to a carbon-free economy – something that the Earth's biosphere needs much earlier than we plan to institute – might actually never occur.

At the time of this writing, the construction of Nord Stream 2 has been halted due to US sanctions against the project, which will most likely merely delay the pipeline's completion by about a year. But why is it that the only real form of opposition to Nord Stream 2 comes from the power that would simply prefer to cook the planet with its own "freedom gas"?

2.

In May 2017, Russian president Vladimir Putin signed an executive order titled "On the Strategy of Economic Security of the Russian Federation until 2030." This order includes a list of ongoing "challenges and threats to the economic security" of Russia identified at that time. High on the list – number six of twenty-five points – is a threat formulated as follows: "Changes in the structure of global demand for energy resources and their consumption patterns; development of energy-saving technologies and reduction of material consumption; development of 'green technologies.'"[7]

This statement warrants closer attention. It's not difficult to see why the "development of 'green technologies'" is an existential threat to the Russian Federation, one of the world's largest exporters of fossil fuels and, according to most estimates, the owner of the largest stock of reserves of natural gas on Earth. This particular list of "threats and challenges" also happens to coincide more or less with a number of actions that are necessary to undertake if humanity is serious about its survival on the planet. As it becomes increasingly evident that the future of humankind depends on its ability to switch to a global economic model that would make the industrial burning of fossil fuels obsolete, the mere hope of such a switch – however distant it might seem at the moment – is now officially recognized as a threat to the regime that governs Russia. Clearly, the Russian political model values the future of fossil fuel and capital flows over the future of the innumerable species (including humans) whose existence is threatened by climate change. A question worth asking, then: Is the Russian government actually being, perversely, more straightforward than most other governments about the fact that they are ultimately accountable to entities such as gas, oil, and their derivative petrocurrencies, rather than to the members of human society who voted them into power?

Well before Trump came to power, it was abundantly clear that the global carbon-based capitalist model is incompatible with the futures of democracy and of the environment. Despite the broad scientific consensus on the grave effects of the fossilized economy on the planetary climate, and despite the cautious intergovernmental half-measures to prevent a catastrophic scenario (like the nonbinding Paris Accord of 2015, which the US government has already opted out of anyway), "extreme" fossil fuels investments continue to surge.[8] Of all the fringe ideologies and discarded ideas that the Trump presidency has brought into the mainstream, climate change denialism could probably have the most lasting and damaging impact on the future of humankind. Of course, Donald Trump's "climate skepticism" is far more publicized than that of his Russian counterpart and political patron – even though the effect of the latter could be more fundamental, given Putin's global support of fossil fuel kleptocrats and right-wing conspiracists, Trump included. Like Trump, Putin has repeatedly questioned the human-made nature of climate change, and went as far as to ridicule the use of alternative energy sources like wind turbines for the alleged harm their vibration may cause to worms, urging them to "come out of the ground." (The US president, meanwhile, focuses on turbines' apparently murderous effect on birds). Again, this unprecedented (and scientifically baseless), disproportionate concern for subterranean,

Participants in the Baltic Sea Day Environmental Forum 2017 couldn't care less about the ecological aspects of Nord Stream 2. Copyright: Nord Stream 2 / Anatolij Medved.

nonhuman entities – inanimate, like oil and gas, or animate, like worms – provides clues as to the actual allegiance of a certain public servant named Vladimir Putin.

Most commonly, the Russian political model is the object of human rights–based, postcolonial,[9] or liberal-democratic criticism of what the Putinists themselves call "the illiberal model." In order to make sense beyond the redundantly anti-communist "post-sovietology" in the vein of "Cold War 2.0," these perspectives should necessarily be supplemented with (or sublated in) more universalist – that is, ecological – modes of critique. It is well-known that the infrastructure for the extraction and transportation of fossil fuels – mainly, the oil and gas pipelines that cover the Eurasian continent – form the basic source of the economic and political survival of Putinism. Moreover, those networks guaranteed the emergence of a particular political regime, which arose in the 1990s on the ruins of the Soviet Union and solidified in the early 2000s – largely due to high prices of oil and gas on the global market.

Surprisingly, Russia's catastrophic climate policies are largely ignored in most critical accounts of the looming ecological disaster. Naomi Klein's verdict in *This Changes Everything* (2015) – that capitalism is incompatible with the survival of planetary ecology – is nowhere more obvious than in the case of Russia's current capitalist model. Still, Russia is conspicuously absent from Klein's critique: in *This Changes Everything,* Russia is only mentioned twice; the collapse of the USSR also gets two mentions. For the ecological critique of capitalism to become a truly global political front, as Klein urges, Russia's disproportionate exemption must be overcome.

Given the overwhelming importance of oil in the twentieth-century economy, political and economic theorists have given this kind of fossil fuel a great deal of attention. In many cases, this scrutiny is informed by the notion of the "oil curse," that is, the tendency of oil-rich states to evolve into autocracies: internally oppressive, externally aggressive, and overall inefficient. This notion has of course been unfavorably applied to Russia and the fossil fuel lobby that is running the country, along with Iran, Venezuela, Nigeria, and other states "cursed by oil." In *Carbon Democracy: Political Power in the Age of Oil*, Timothy Mitchell exposes the limitations of the "oil curse" theory. Instead, Mitchell undertakes a study of "democracy as oil – as a form of politics whose mechanisms on multiple levels involve the process of producing and using carbon energy."[10] Mitchell's book seeks to answer a critical question: "Can we follow the carbon itself, the oil, so as to connect the problem afflicting oil-producing states to other limits of carbon democracy?"[11] As natural gas overtakes oil's previous status as the most important fossil fuel of the current century, this inquiry should be extended. Will oil-based liquid modernity make way for a data-based, gaseous postmodernity?

What follows is an attempt to "follow the carbon itself," by tracing and collaging its various footprints within histories of ideas, technology, and popular culture, in an effort to grasp the evasive substance of natural gas through the no-less-evasive field of the social imagination – informed by the Cold War and the current geopolitical attempts at its reenactment.

In 2017, *The Economist* famously claimed that "data is the new oil." At the time, Wendy Chun's response to this statement was: "Big data is the new COAL. The result: global social change. Intensely energized and unstable clouds."[12] Still, both coal and oil are likely to decline as energy sources. Another question worth asking, then, is: what if data is actually the new gas?

3.

The first-ever computer hacker to feature in a Soviet film appeared in a political drama called *Deal of the Century* (1985). In one scene, this American hacker (played by popular actor Valentin Gaft) struggles to break the computer security system of a Soviet trade mission in Germany, in his effort to prevent the signing of a gas contract between West Germany and the USSR. The film is generously interspersed with documentary news footage of the Reagan administration's attempts to prevent the deal that would allow the export of Siberian gas to West Germany. Those attempts did, in fact, happen, but they failed to halt a decades-long process that ultimately led to the emergence of the Soviet Union – and later, of Russia – as a major carbon empire.

In 1970, the Soviet Union and West Germany signed the contract that inspired the film. The contract was preceded by a decade-long global dispute following the discovery of unprecedented reserves of natural gas in Siberia. The Soviet Union lacked the technology to construct the pipeline system needed to transport the gas to consumers, while West Germany – whose industry was capable of providing these pipes – began showing interest in helping the Soviets build this system. West Germany's offer of assistance with construction came with the condition that the new pipelines would penetrate the Iron Curtain and that Siberian gas would flow to the West. Throughout the early 1960s the US government fiercely opposed the idea, and in 1963 then-chancellor

A munitions clearance operation on the Nordstream 2 pipeline route, which runs in close proximity to World War II chemical weapons dumping grounds. Copyright: Axel Schmidt.

Adenauer had to ban German pipe exports to the USSR. Still, part of German industry cherished the plan, and in 1970 the pipe ban was overcome. After the deal was signed in Essen in 1970, it was colloquially called "gas in exchange for the pipes." Russian historians unequivocally refer to this contract as "the deal of the century." This was the first in a long series of deals between Western powers and the Soviet Union that, after its collapse, has led to the emergence of an autocratic system based on a ruthless extractivist attitude to the Earth's resources, facilitated by transcontinental oil and gas transportation networks.

Those networks – the world's longest at the time – required unprecedented technological expertise, and in this regard the Soviet Union could not count on Western technology (as it did with the German pipes). In the Soviet TV series *Acceleration* (1984), a group of cybernetic scientists are tasked with computerizing the natural gas transportation network after the US blocks delivery of some needed technology. In one of the scenes, the cyberneticians discuss this gas network as a self-regulating living organism. One of them proposes the concept of the "animation/resuscitation of the equipment."[13] In other words, they recommend reframing the gas network as an intelligent being with a subjectivity of its own, carrying billions of cubic meters of natural gas to be emitted into the atmosphere – a truly post-humanist utopia of a Soviet kind.

This animation or resuscitation of the gas network wasn't an outlandish fantasy on the part of the filmmakers. In fact, the plot of *Acceleration* was loosely based on the life story of Viktor Glushkov, a pioneering computer scientist tasked with building oil pipeline networks, among other things, after his bold idea of an information network for the USSR was shelved, and his groundbreaking research on socialist artificial intelligence was put on the back burner by authorities. Glushkov was a leading figure in Soviet cybernetic science, a science that he claimed had to be applied to each and every sphere of socialist society. He declared that cybernetics allowed for the transformation of "the social sciences into exact sciences." As a result, he claimed, society as a whole would function as one gigantic cybernetic organism running on feedback loops and socialist self-regulation. In 1970 – the same year of the "deal of the century" – top party officials downsized Glushkov's idea for an overwhelming information-management-and-control network to a series of smaller-scale, disparate network projects. For the better part of the 1970s, he was busy computerizing the Druzhba (Friendship) oil pipeline network that carried Siberian oil into Eastern Europe.

In public, Glushkov held that his Druzhba network was an example of a perfect marriage of cybernetics and ecology, claiming that

> we've developed methods that allow for the use of contemporary computing machines to predict the behavior of all kinds of ecological systems, to model all future options for the development of these systems, and to discover the solutions that would allow us to find the right compromise between the economic needs of the people and their natural need to preserve the environment.[14]

During closed-door meetings, however, he delivered much darker accounts of his fossil fuel networks, claiming that they were not economically feasible due to the inevitable exhaustion of oil resources.[15]

Glushkov's cybernetics had its roots in the Cold War reception of Norbert Wiener's cybernetic theories, which proliferated in the USSR soon after Stalin's death. However, Glushkov's vision of cybernetics as a tool for mastering nature stemmed from a strand of philosophical thought that had much deeper roots in the Soviet context. It's hard to ignore the affinity between Glushkov's vision of cybernetics as a mode of total socialist management and the "universal organizational science" of Alexander Bogdanov – philosopher, natural scientist, and militant Bolshevik. Bogdanov coined the term "tektology" to describe his totalizing vision of a neopositivist science outlining the universal principles (those of organization as opposed to disorganization) that underlie every known phenomena in the universe: from galaxies to human societies to bacteria. Bogdanov radically undermined not just the distinction between natural sciences and the humanities, but also between theory and practice – a stance later adopted by Glushkov, who claimed "unity of theory with practice" as a founding principle of his cybernetic science. The latter's position also shared with Bogdanov's tektology the belief that natural, social, and technological systems function according to the same organizational principles, which may be scientifically identified and put to purposeful use.

For Bogdanov, nature was "changeable," following knowledge of the universal rules of progress that he had offered to the Bolsheviks (no wonder that McKenzie Wark, in her 2015 book *Molecular Red,* regards Bogdanov as a Soviet prophet of the Anthropocene). Bogdanov's work on tektology, published in the Soviet Union throughout the 1920s, was no doubt a major influence on the Bolshevik project of

Construction corridor for the Russian onshore section of Nord Stream 2 pipeline. Copyright: Nord Stream 2 AG / Agiteco.

"revolutionizing nature," as Oksana Timofeeva names the Soviet effort of "diverting rivers, blasting mountains, making animals speak: the idea was to transform the Earth by means of technology in order to make it, as Andrei Platonov says, more 'kind to us.'"[16] Bogdanov's tektology is also cited as a major (albeit, uncredited) influence on Ludwig von Bertalanffy's general system theory, the cybernetic theories of Ross Ashby, and the writings of Norbert Wiener himself – via the German translation of *Tektology*, published in 1926. For instance, it's been pointed out that in *Tektology,* Bogdanov described the notion of feedback, crucial for cybernetic science, using a different term of his own coinage: "bi-regulation." In the Soviet Union, Bogdanov's writings were officially denounced as idealistic perversions of materialist dogmas. His tektology only made a comeback in the postwar decades, as it was incorporated into Western cybernetic science and reimported back to the USSR in a vertiginous transcontinental give-and-take of ideas.

The abridged English translation of *Tektology* starts with a claim that's actually absent in Bogdanov's original – at least in such straightforward terms: "In the struggle of mankind, its aim is dominion over nature. Dominion is a relationship of the organizer to the organized."[17] Still, this entangled paraphrase of Bogdanov accurately reflects the perception of his ideas by later practitioners. When Glushkov proposed building a computer network for the total management of economic and information flows, he was setting out on a truly tektological endeavor. When the Soviets were building the transcontinental networks for fossil fuel flows, they were guided by the idea of "changeable" nature. Few could see the direction this change was taking.

4.

In the summer of 1982, a gas explosion of unprecedented proportions was said to have destroyed the Trans-Siberian gas pipeline. In his 2004 memoir *At the Abyss*, Reagan administration official Thomas Reed claims that this explosion was caused by Canadian equipment added to the pipeline – sabotage via a Trojan horse tactic. (Post-)Soviet experts, on the other hand, vehemently deny that this explosion ever took place.[18] They claim that the Trans-Siberian gas pipeline network could not be hacked at the time, because it was not yet computerized to a sufficient degree. Given the lack of evidence related to this purported explosion, it seems that the gas network hack took place in the realm of information, rather than through technology – a case of information warfare.

By that time, massive amounts of Siberian natural gas were being exported to Western Europe, and new contracts signed in the wake of the Soviet–German "deal of the century" were proliferating. This caused consternation amongst US officials, who saw this German strategy as suicidal: not only would Europe's access to energy be dependent on Soviet gas networks, but the latter could also, according to some military experts, be used to fuel the Soviet army in case of European invasion. The Germans themselves, though, had adopted a more dialectical-materialist approach to the problem of Soviet natural gas.

Otto Wolf von Amerongen, chairman of the German East–West Trade Committee from 1955 to 2000, later recalled the logic behind the deal: "The gas pipe through the continent is, if you wish, an instrument that not only makes us dependent on the Soviet imports, but also, vice versa, renders their 'crane' dependent on the West."[19] In his conversations with German chancellor Ludwig Erhard, von Amerongen introduced the political dimension into this dialectical vision: "If we are linked together through our gas pipelines, this will mean much more than the sale of pipes or the purchase of gas. The will also lead to a positive change in the political picture in the Soviet Union."[20]

What kind of change would that be, and how would it be achieved? Von Amerongen: "I was always sure that this deal had introduced another *constant medium of communication*, a reliable bridge for further development, or to be more precise, the rebirth of the traditional German–Russian connections that were lost in the course of decades after the October coup in Russia in 1917."[21]

With gas as a medium of communication, what kind of message did its networks convey? At stake was no less than the legacy of what von Amerongen (an ex-Nazi) referred to as "the October coup." In the 1980s, with the Soviet economy failing while (and, in fact, because of) the lucrative fossil fuel export deals proliferated, party elites were faced with the chance to put this enormous wealth to personal gain. The top-down collapse of Soviet Communism was, among other things, the result of a successful attempt by the party apparatus to privatize the enormous profits derived from the extractivist economic model in its transition to capitalism. The message delivered by the Western elites to their Soviet counterparts – "abandon communism for your personal profit!" – was conveyed through the medium of natural gas.[22]

In the post–Cold War world, after the "end of history" – which is gradually morphing into the end of a habitable climate – is a project like Nord

Stream 2 designed to serve as another channel of constant communication? With US sanctions against Nord Stream 2 strangely appearing as a reenactment of the Reagan-era sanctions against the Trans-Siberian pipeline, are we definitively stuck in a final historical loop, a dead end in which the only real resistance to this politically and environmentally devastating project comes from a no-less-devastating competitor whose only solution is: burn "freedom gas" instead? *Abandon the planet for your personal profit!* – this is the message conveyed by virtually every communications medium in this echo chamber, be it the medium of an underwater gas pipeline or a liquid natural gas terminal.[23]

But if carbon infrastructure is a medium of communication, then it can be – like any other such medium – disrupted, subverted, and hacked. This is where, to quote Nick Dyer-Witheford, the dominant structures are most vulnerable today: "If we're going to look at the equivalent of something that was like strike power, we need to look to hacking, we need to look at the new vulnerabilities of capital that lie in its transportation and logistics networks, we need to look at the possibilities of the interruption of its various types of energy flows: both electrical and otherwise."[24] But who would be the agent of this strike power?

One recent development in the extraction industry provides a glimpse of what form this agent might take. In January 2020, Russian Gazprom announced a major decrease in its monthly production of natural gas. The reason for this decrease? Unexpectedly high temperatures in gas extraction areas.[25]

Postscript: This is a revised version of an essay that was intended for publication in the *Almanac of the Center for Experimental Museology*, but it was withdrawn by the author after it was censored by the publisher, V-A-C Press (Moscow). The fragment excised by the editors is reproduced here in full:

> The moment at which this text is written is crucial and greatly impacts what I have to say in the following paragraphs. I'm writing these lines on the fortieth day of Ukrainian film director Oleg Sentsov's hunger strike, while he is held in a Russian prison camp in the Arctic. Sentsov demands the immediate release of all political prisoners from Ukraine currently jailed in Russia. Before he was kidnapped by the Russian Federal Security Service during the military occupation of the Crimean Peninsula in May 2014, Sentsov resided with his family in Crimea. Together with the anti-fascist eco-activist Olexander Kolchenko, he was accused of plotting a terrorist attack as a protest against the annexation of Crimea by the Russian army. Detained in Crimea, Sentsov and Kolchenko were then kidnapped and transported to the Russian Federation, where, in defiance of all judicial norms, the two were stripped of their Ukrainian citizenship and put on a show trial that found them guilty – despite the absence of evidence, and on the basis of forced confessions by two other tortured political prisoners. Sentsov and Kolchenko were sentenced, respectively, to twenty and ten years in prison camps. In Russia, this trial had been instrumental in silencing any possibility of dissent against the 2014 occupation of Crimea and Russia's sparking of the war in East Ukraine. This silencing especially targeted artists and cultural workers: the scapegoating by the Russian secret services of Oleg Sentsov, who had worked in Crimea as an auteur filmmaker, was conspicuously random, as if its sole meaning was to send a message to other artists: stay away from politics, for this can happen to anyone. In a similar vein, the conviction of Olexander Kolchenko was meant to introduce a purely Orwellian dimension into this process: a committed anti-fascist, he, along with Sentsov, was accused of participation in a far-right Ukrainian group. The imprisonment of Sentsov and Kolchenko led to a swift deterioration of cultural and artistic links between Russia and Ukraine, with numerous Ukrainian artists and cultural workers boycotting any Russia-related projects. As a counterpart to this boycott, since 2015 I've been practicing a strategy of accepting invitations from Russian non-state institutions with the purpose of hijacking public debate and staging interventions based on the cases of Sentsov and Kolchenko. While working on this particular essay, I was surprised to discover that no special intervention of this kind would even be needed in this case, as my research trajectory had actually brought me to a point that reflects the context of Sentsov's case with unexpected clarity. While this research is focused on the manifold ways that the exploitation of natural resources, primarily natural gas, affects cultural and political developments by boosting colonial and authoritarian practices, Sentsov is holding his hunger strike in a town called Labytnangi in the Yamalo-Nenets Autonomous Region in Russia's Far North, which is where one of the world's largest gas fields is located.

There, reduced to the position of *homo sacer*, Sentsov is challenging the regime from the very heart of Russia's natural gas empire. It is an extremely dire, but somehow, still strangely hopeful coincidence which reinforces the intuitions that brought this text into existence.

As of March 2020: Oleg Sentsov survived his hunger strike, which lasted for 145 days. He and Oleksander Kolchenko were released by the Russian government in a prisoner swap in September 2019.

V-A-C press is a project of V-A-C Foundation, cofounded by Leonid Mikhelson, head of Novatek company, Russia's second-largest natural gas producer, based in the Yamalo-Nenets Autonomous Region where Oleg Sentsov was held illegally.

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Oleksiy Radynski is a filmmaker and writer based in Kyiv. His films have been screened at Oberhausen International Short Film Festival, Institute of Contemporary Arts (London), DOK Leipzig, Bar Laika by e-flux, and Kmytiv Museum among other venues, and received awards at a number of film festivals. His texts have been published in *Proxy Politics: Power and Subversion in a Networked Age* (Archive Books, 2017), *Art and Theory of Post-1989 Central and East Europe: A Critical Anthology* (MoMA, 2018), *Being Together Precedes Being* (Archive Books, 2019), and in *e-flux journal*. After graduating from Kyiv-Mohyla Academy, he studied at Ashkal Alwan's Home Workspace Program (Beirut). Radynski is a participant of the Visual Culture Research Center, an initiative for art, knowledge, and politics founded in Kyiv, 2008. Currently, he is a BAK Fellow at basis voor actuele kunst, Utrecht.

1
Frédéric Simon, "'Freedom Gas': US Opens LNG Floodgates to Europe," *EURACTIV,* May 2, 2019 https://www.euractiv.com/section/energy/news/freedom-gas-us-opens-lng-floodgates-to-europe/.

2
One notable, albeit decidedly belated, exception is found in Maria Haensch, "Green Group Challenges Nord Stream 2 Permit in Germany," *Montel News*, March 5, 2020 https://www.montelnews.com/de/story/green-group-challenges-nord-stream-2-permit-in-germany/1094429. It's also curious that most of the available ecological criticism of Nord Stream 2 focuses mostly on the damage done by the pipeline to the Baltic seabed, rather than the problem of increased emissions as a result of the project.

3
See, for example the Rethink Nord Stream 2 Campaign https://rethinkthedeal.eu/.

4
See, for instance, this document by Rethink Nord Stream 2 https://rethinkthedeal.eu/wp-content/uploads/sites/4/2019/10/Brochure-A4-Germany-EN-Web.pdf.

5
In December 2019, a contract on gas transit between Russia and Ukraine was extended for five more years, which helped to avoid a full-blown "gas war" of the kind that happened in 2009, but still looks more like an attempt to extend the agony. See https://en.wikipedia.org/wiki/2009_Russia%E2%80%93Ukraine_gas_dispute.

6
The fact that a certain Ukrainian natural gas company, of all things that Trump messed with, found itself at the epicenter of the recent impeachment proceedings, speaks volumes of the unprecedented political importance of post-Soviet carbon infrastructure.

7
See http://kremlin.ru/acts/bank/41921/page/1.

8
Arthur Nelson, "'Extreme' Fossil Fuel Investment Have Surged Under Donald Trump, Report Reveals," *The Guardian*, March 28, 2018 https://www.theguardian.com/environment/2018/mar/28/extreme-fossil-fuel-investments-have-surged-under-donald-trump-report-reveals.

9
See, for instance, David Chioni Moore, "Is the Post- in Postcolonial the Post- in Post-Soviet? Toward a Global Postcolonial Critique," *PMLA* 116, no. 1 (January 2002). Available at http://monumenttotransformation.org/atlas-of-transformation/html/p/postcolonial-post-soviet/is-the-post-in-postcolonial-the-post-in-post-soviet-toward-a-global-postcolonial-critique-david-chioni-moore.html.

10
Timothy Mitchell, *Carbon Democracy: Political Power in the Age of Oil* (Verso, 2011), 5.

11
Mitchell, *Carbon Democracy*, 6.

12
See https://twitter.com/whkchun/status/927576076796203008.

13
In the original Russian: "одушевление оборудования."

14
As quoted in the film *Plenyat' Zadachey Nebyvaloy* (Kievnauchfilm, 1982).

15
Victor Glushkov, "Pro ekonomicheskuyu kibernetiku. Doklad na zasedanii Prezidiuma AN USSR" (About economic cybernetics: Report at a meeting of the Presidium of the Academy of Sciences of the Ukrainian SSR), sound recording.

16
Oxana Timofeeva, "Ultra-Black: Towards a Materialist Theory of Oil," *e-flux journal*, no. 84 (September 2017) https://www.e-flux.com/journal/84/149335/ultra-black-towards-a-materialist-theory-of-oil/.

17
Alexander Bogdanov, *Essays in Tektology*, trans. George Gorelk (Intersystems Publications, 1980), 1. Thank you to David Muñoz Alcantara for inadvertently drawing my attention to this translational misunderstanding.

18
An essay refuting Reed's hypothesis was cowritten by none other than Viktor Glushkov's daughter, Vera Glushkova: V. D. Zakhmatov, V. V. Glushkova, and O. A. Kryazhich, "Vzryv, kotorogo ... ne bylo!" (An explosion that ... wasn't!) http://ogas.kiev.ua/perspective/vzryv-kotorogo-ne-bylo-5 81.

19
Ekaterina Labetskaya, Fedor Lukyanov, Alexey Slobodin, and Yuri Shpakov, "Truba v beskonechnost' Khronika samoy bol'shoy sdelki v rossiysko-germanskoy istorii" (Pipe to infinity: A chronicle of the largest deal in Russian-German history) http://www.vremya.ru/print/3739.html.

20
Labetskaya, Lukyanov, Slobodin, and Shpakov, "Truba v beskonechnost.'"

21
Labetskaya, Lukyanov, Slobodin, and Shpakov, "Truba v beskonechnost,'" emphasis mine.

22
When discussing carbon infrastructure, Aleksander Etkind claims that during the Cold War gas was as essential to state socialism as oil was to capitalism. Since it was much harder to stockpile gas than oil, gas was transported based on long-term guaranteed contracts, which, according to Etkind, made it an ideal resource for the planned economy. Furthermore, he writes that *liquefied* gas changed the political economy of gas: it could now be stored and sold according to need – that is, gas became a market commodity. Aleksander Etkind, *Priroda zla: Syrie i gosudarstvo* (Evil nature: Raw materials and the state) (Novoye Literaturnoye Obozreniye, 2019).

23
In the context of Russian political economy, data is quite literally the new gas: the superprofits acquired through fossil fuel exports make it possible for the Russian state to fund its massive disinformation campaigns around the globe, as well as high-profile hacking operations, troll armies, and proxy militias. Gas is exported to foreign consumers whose payments are then converted into malicious data, unleashed upon those consumers themselves.

24
Nick Dyer-Witheford, "Cybernetic Revolutions and Surplus Populations," lecture delivered at The School of Kyiv, October 25, 2015, Q&A.

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