Coal's Last Gasp, Its Resuscitation by Media, and the Habitus of NIMBY

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Abstract: The shift away from coal to renewable energy for electricity generation is producing environmental benefits during the climate crisis but also poses uncertainty for coal producers and others along the coal supply chain. Media representations of the coal debate shape how citizens understand and respond to it. This commentary exposes how audiences - even of pro-environmental media - reproduce dominant discourses promoted by fossil fuel corporations and reconceptualize those discourses into a Not in my Backyard (NIMBY) worldview. Critical discourse analysis helps to reveal how tensions between coal companies and renewable energy proponents are exacerbated by controlled coal messaging. Coal propaganda evokes images of a noble and reasonable energy source and places coal within a positive framework that enhances local knowledge, protection, and economic security. Conclusions point to the importance of media literacy instruction as a means for consumers to gain critical distancing strategies and broader perspectives about the climate crisis.

Keywords: coal, propaganda, climate crisis, media literacy, critical discourse analysis

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Introduction

In the United States, roughly 30% of all electricity comes from coal (Union of Concerned Scientists, 2019); the rest comes from natural gas, nuclear power, and renewables like wind and solar. Generally, people think coal is an energy of the past, but when looking at coal usage globally, it's clear that coal is still a predominate energy source, with 24% of global electricity coming from coal (U.S. Energy Information Association, 2020). When considering carbon emissions as a U.S. national issue, it is important to evaluate the locations where coal is being used, by which populations, and how coal directly impacts the climate crisis. About forty coal-burning power plants (Appenzeller, 2020) are currently being designed or built in the U.S. to satisfy America's ravenous electricity use. West Virginia, Illinois, Kentucky, and Pennsylvania lead the U.S. in coal production and reliance (U.S. Energy Information Administration, 2018). Coal's negative effects on the environment result from coal combustion and include sulfur dioxide, nitrogen oxide, carbon dioxide, and mercury emissions, which have been variously linked to respiratory illnesses, neurological and developmental damage in humans and other animals, smog, and greenhouse gas.

During industrialization - the period roughly between 1760 and the late 20th century - coal was incredibly valuable as a commodity and gained huge geopolitical importance. But now coal needs to stay in the ground if nations are to tackle the transition to renewable energy sources and continue life on the Earth as is currently understood. Coal has lost much of its allure except in disparate sectors that rely on it for commerce. Yet, not everyone agrees that coal's place is in the past. Several conservative organizations - including American Energy Alliance, Institute for Energy Research, National Energy Foundation, among others - promote coal even though energy markets are shifting, both in the US and abroad, to renewable energy sources.

A number of proponents have pushed to maintain coal's status in recent years in the U.S. and in the global energy mix. Robert E. Murray, a longtime Trump supporter who donated $300,000 to the President's inauguration, wrote a memo detailing a wish list of environmental rollbacks, and the White House and federal agencies have completed, or are on track to fulfill, most of the 16 detailed requests. Wells Griffith, a spokesperson for the U.S. Department of Energy, was mocked by audience members as he celebrated the virtues of coal at the COP24 summit in Katowice, Poland. The Heartland Institute cried out that the premature retirement of the U.S. coal fleet was causing electricity prices to rise and bemoaned how closures would lead to rolling electricity blackouts in many parts of the U.S. The American Enterprise Institute claimed that increases in U.S. oil and gas production helped counteract efforts by OPEC and Russia to raise global energy prices. Australia's Coalition MPs warned against the "demonization" of coal.

Increasing politicization of climate science and the attempts of vested interest groups, sometimes known as "merchants of doubt" (Oreskes & Conway, 2010), to undermine the scientific consensus on climate change continue to be evident in the run-up to the 2020 U.S. presidential election. The coal industry spent just under three million dollars in 2019 on campaign donations - primarily for Republicans, as only 4% of coal donations were directed to Democrats (Open

Secrets, 2020). These donations fund campaigns to convince citizens, utilities, and governments that continued investment in coal is necessary. The donations have resulted in organized disinformation campaigns that deny that the climate crisis even exists and perpetuates reliance on coal. As a result, public skepticism of renewable energy poses a barrier to its full development and implementation. As early as 2004, Devine-Wright identified NIMBY, which stands for "not in my back yard" and NIMBYism as an explanation for negative perceptions of renewables, which can be drawn from incorrect or incomplete knowledge, commitment to a sense of place, lack of trust in change, or entrenched environmental attitudes. In the last decade, for example, unhappy neighbors and associations have blocked homeowners from installing solar panels on rooftops and in yards, deploying complaints about sullying the neighborhood character, a position propagated by fossil fuel spin. NIMBYism is at the root of many cleantech industry problems, and coal is benefitting from the NIMBY malaise.

"All politics is local," former House Speaker Tip O'Neill (1995) famously uttered, referring to the principle that a politician's success is directly tied to their ability to understand and influence the issues of their constituents. The coal industry has simplified the story of the decline of coal and blamed it entirely on environmental regulation (Mayer, 2018), to the point where many local communities are reluctant to transition away from coal dependence, with variables of isolation, limited planning, and weak fiscal capacity creating barriers to renewable energy. Coal proponents create comfortable slogans like "clean coal" while converting coal pollution into invisible carbon dioxide. Faulty grid reliability studies (Casey, 2017) emerge as little more than thinly-veiled propaganda for the coal industry and tools to justify expensive government handouts to outdated coal power plants.

The complex and divisive issue of coal's contribution to the climate crisis continues to be strongly influenced by unfiltered propaganda that is often funded by conservative think tanks. If NIMBY attitudes about coal are to be dispelled, then the individuals most keenly affected by coal must gain the tools to step away from coal propaganda and see how highly orchestrated pro-coal campaigns are designed to be responsive to the feelings, needs, and shared beliefs of particular audiences (Hobbs, 2020). Critical media literacy is an efficacious way to shatter the mythology around coal. Indeed, when exposed to critical media literacy strategies, energy consumers can learn to examine epistemologies and persuasive appeals. They can identify purposes behind energy messages, develop feelings of personal significance while engaging in social interactions and energy options, and transcend media rhetoric by gaining critical analysis structures (Fortuna, 2015) that allow for problem-solving and decision making about fossil fuels and renewables as personal energy choices.

As a result, this commentary proposes a critical media literacy initiative that gives individuals of all ages the tools to become critical consumers of media energy messages. A highly useful form of critical media literacy analysis, called critical discourse analysis, is modeled within this commentary in order to identify and make transparent prevalent frames, news values, and discursive strategies in social media about coal's relationship to the climate crisis.

Background

Coal and the Power of Media Messaging

Media are an important space for information exchange, debate, and opinion formation on a range of issues, including the climate crisis. In the 2016 U.S. presidential election, coal became a vicious point of contention. How could any patriot turn her back on the U.S. coal worker and his family? In July 2019, the United Mine Workers of America invited every Democratic presidential hopeful to tour a coal mine and to discuss their energy policies; the announcement made media headlines for days. Public perceptions of candidates and their positions on coal continue to be strongly influenced by social media stories and broadcasts.

Indeed, social media networks are increasingly important forums for public debate and are known to influence individual attitudes and behaviors. Social media now function as diplomacy, promoting cultural products and national values through the use of specific texts, messaging, and visual images. Media in this sense is a business that survives in a data-rich world by targeting readers, viewers, and subscribers as products for other businesses. These media products - audiences - now take precedence over advertisements as revenue streams and have subsumed a prior media role of disseminating news for the public. As a result, since audiences are a type of commodity that is produced, sold, distributed, and consumed through contemporary propaganda (Herman & Chomsky, 2002), media now focus on goals to activate strong emotions, respond to audience intrinsic desires, simplify information, and attack opponents to accumulate data.

When confronted with two sides of an argument, indecisive individuals tend to choose the least disruptive. That is because they are, on average, less informed and less discerning people who cannot distinguish the difference between two positions that offer wildly different visions for the future (Kilgore, 2019). A 2018 Pew Research study drew the same conclusion, as roughly a third of respondents predicted that harm to well-being will outweigh the positives overall in the next decade. Corporations, businesses, and public institutions pay close attention to such studies and design strategic messaging in the hopes of securing public and private funding that can amount to billions of dollars. For example, coal companies want federal money for research on removing and sequestering carbon emissions and to preserve their position as dominant players in the U.S. energy supply.

Money is at the core of the current U.S. Congressional stalemate and unprecedented polarization over measures to tackle the climate crisis. This inertia is fed by the fossil fuel industry, and the topic of coal is central to such political divides. Ideologically motivated organizations have orchestrated influential disinformation campaigns in which they publicly dispute the scientific consensus on the human-caused climate crisis, and their campaigns have prevented deeper societal engagement with the most pressing and existential issue of our lifetime. Such public divides call to mind Bordieu's (1977) *habitus,* an apt term to describe the deeply ingrained

habits, skills, and dispositions that individuals possess and that arise from life experiences. *Habitus* describes coal advocates' intransigence over the climate crisis. Long-held beliefs, thoughts, ideas, and practices about coal - "norms" - that seem to be simple common sense likely have emerged from one-dimensional, deeply orchestrated precedents from individuals like the Koch brothers (Fisher, 2012) rather than through individual synthesis after considering competing visions. Consumers who support coal's ongoing status as a relied-upon energy source enact their dispositions about coal, their ways of speaking about coal, even the way they interact with opponents of coal as part of *habitus* -- they learn the skills, knowledge, and practices to be coal advocates from the more experienced cohort of coal advocates. These coal advocate veterans have patterns of exposure to dominant media representations that represent coal as a positive and appropriate energy source, creating an intergenerational belief system cycle.

Discourse in such communities lacks oppositional arguments: aren't coal companies morally and legally obliged to warn U.S. citizens that its continued use threatens human health and welfare? Shouldn't coal companies be liable for the coal contributions to the current unacceptable levels of carbon emissions? Why don't coal companies invest robustly in reducing, mitigating, and eliminating those emissions? Instead, the industry continues to invest in climate denial and obfuscation in order to delay legislative action and avoid losing market share.

The Contemporary State of Coal and the Climate Crisis

The Intergovernmental Panel on Climate Change (IPCC) issued warnings in 2018 that the worst impacts of the current climate crisis can be avoided only by a "far-reaching and unprecedented" transformation of the global energy system, including virtually eliminating the use of coal as a source of electricity. The IPCC announced that global net human-caused emissions of carbon dioxide would need to fall by about 45% from 2010 levels by 2030, reaching net zero around 2050. This means that any remaining emissions would need to be balanced by removing CO2 from the air. U.S. President Donald Trump has not heeded the IPCC warnings and, instead, communicated to coal miners throughout his 2016 candidacy and into his term in office that his administration would provide increased work opportunities for the coal industry. Nonetheless, in the three plus years since Trump was elected U.S. President, U.S. coal mining employment has been on a downward spiral. According to the Bureau of Labor Statistics (2020), the coal industry employed nearly 90,000 persons in 2012 but only lists approximately 50,000 in 2020. The U.S. Energy Information Administration (2020) forecasts that U.S. coal production will total 595 million short tons in 2020, down 95 MMst (14%) from 2019. Lower production reflects declining demand for coal in both the electric power sector and U.S. exports.

In the 2016 election year, a Pew Research Center survey found that 41% of those surveyed favored more coal mining, while a 57% majority opposed it. The 1,534 respondents (1,385 by web and 149 by mail) were randomly assigned to complete one of three forms or sets of questions on the survey. Fast forward just one year, and a 2017 National Survey on Energy and Environment of 904 individuals (20 Democrats, 262 Independents, and 217 Republicans) found an 11% point shift in public opinion, so that fewer individuals than ever supported the coal

industry or saw it as a viable energy source for the future. However, some researchers (Burgess, 2020; Clemente, 2019; Kirk, 2019) suggest caution before proclaiming the demise of coal. They remind energy advocates that coal exports to Asia and Europe are stable, although at below the 2013 peak. Significantly, just three countries use 71% of the world's coal. Overall, coal capacity is still growing – although more slowly in previous years.

Coal reliance is a detriment to the world's atmosphere. Addressing the global climate crisis will require large-scale changes in human behavior and decision-making (van der Lindenvan, Maibach, & Leiserowitz, 2015). Climate action is needed to address the problem, and critical media literacy tools like critical discourse analysis can provide mechanisms to distinguish scientific conclusions from politicized and profitability-based coal propaganda.

Theories and Framework

In this commentary, we discuss how many narratives point to the demise of the coal industry, the broad scientific consensus on the principal mechanisms and causes of the climate crisis (IPCC, 2018), the depictions of the coal industry by various media channels, and the reactions of US citizens to those media messages about climate change. We draw in part on Takahashi and Tandoc's (2015) research to understand what predicts scientific knowledge, and we work from the premise that interest in science emerges through its effects on social media use, confidence in the press, and the perception of the scientific community. As a result, the media framing process of what constitutes scientific knowledge becomes imperative. Framing is the selection of discourse to communicate information about an issue as well as the effect of such choices on how audiences form opinions. Framing that is employed strategically by media communicators around climate change has contributed to polarization among strategic segments of the U.S. public.

Further, critical discourse analysis as modeled by Fairclough (2012) informs this commentary. By analyzing the language level of meaning-making, contemporary processes that promote or hinder social change through shifting attitudes toward coal become transparent. The objective of critical discourse analysis is to give accounts of the ways in which and extent to which social changes are enacted in discourse, specifically social media, the relations between changes in discourse, and changes in other, non-discoursal, elements or moments of social life. As such, critical discourse analysis reveals a series of frames that channel how people understand the coal industry as a viable energy source for the US and countries around the world. A critical media literacy approach to the acquisition and accommodation of climate science knowledge can systematically make evident the media's contributions to and responsibility for misinformation about coal reliance. Moreover, the acquisition of critical questioning and analysis strategies has the capacity to influence *habitus* (Bourdieu, 1977) toward a positional shift to renewable solar and wind-powered energy sources.

This commentary highlights the way that some readers of a social media environmental magazine react when coal is the featured topic. The audience: (1) recapitulates dominant

discourses around coal's inevitability in the energy mix, (2) adheres to coal's prominent role in securing energy financial markets and, (3) questions how, if, and when renewable energy can replace coal without threatening grid stability. Here, knowing is something individuals do, an action that requires heightened self-awareness and reflection, even with regard to local matters like coal's influence on a community. "Dialectics" (Zizek, 2020) - philosophical arguments that involve a rather contradictory process between opposing sides - comes into play here, as it can help people scrutinize their worlds - in this case, their climate crisis worlds. Dialectic reasoning around coal's place in the contemporary energy mix generates numerous contradictions against a backdrop of the climate crisis' existential threat. By weaving in and out through a web of emotions, social media stimulus, and traditional influences, individuals who commented on the nature and durability of coal within a social media environmental article preserved *habitus* - cultural ways of knowing energy sources, which limits possibilities toward renewable energy transcendence.

The Role of Literacy

Literacy and knowing one's world are inextricably connected. Internet access has recreated the ways that people communicate, as accessing, comprehending, and sharing content has opened up new opportunities to engage in work, life, and citizenship. Social media communication now plays a key role in helping many people develop new knowledge and competencies that are relevant to contemporary life. Yet social media is highly influenced by propaganda. Studying propaganda has fallen out of favor in English language arts classes (Fleming, 2019), and it rarely has been integral to science courses. Lack of formal emphasis on the ways that media consumers are manipulated is troubling, as algorithmic personalization and propaganda are influencing curriculum and instruction in elementary, secondary, and higher education (Hobbs, 2020). Social media platforms now track and predict users' behavior, and these platforms offer refined design and highly customized choices of entertainment, information, and persuasion, which affect how users interact with the Internet and each other.

An essential literacy goal of the science communicator is to convey accurate scientific information in ways that help people examine and, when appropriate, change their existing understandings of the world. Jones & Crow (2017) argue that identifying how a narrative is developed can lead to more effective communication, easier engagement in policy processes, and definitive problem solving. Deconstructing persuasive narratives that speak to the climate crisis is an example of such science-based narrative analysis. In fact, when Carmichael & Brulle (2017) conducted an empirical analysis of factors affecting national-level, quarterly shifts in public concern about the climate crisis between January 2001 and December 2014, they found that partisan media not only strengthened views of like-minded audiences but, also, when Republicans were presented with opposing frames about climate change from liberal media, they appeared to reject the messages. Opposing frames actually decreased concerns in the Republican audience about the climate crisis.

Hobbs (2019), a media literacy scholar who coordinates the Media Education Lab at the University of Rhode Island, offers a free online program called "Mind over Media" which allows users to analyze the effects of propaganda on audiences. She argues that propaganda and misinformation are rising around the world, and now is the time to examine the ethical dimensions of algorithmic personalization in media, culture, and society through information, entertainment, and persuasive content. Companies of all kinds, including fossil fuel corporations, are investing heavily in facial recognition and sentiment analysis in order to benefit from the power of emotional response. The task of facial emotion recognition involves detecting the sentiment portrayed by a person's face, and the ways a human is capable of conveying sentiment (also referred to as emotion) is extensive. Algorithmic personalization ascertains and creates messaging based on such emotions.

An example of the effects of algorithmic personalization emerged in the work of Bolin and Hamilton (2018), who applied generalized structural equation modeling to recent survey data. Findings indicated that political ideology, education, and their interaction predict news media information choices in much the same way they predict opinions about the climate crisis itself. The authors cite how media information sources serve as intervening variables that can reinforce and, through their own independent effects, amplify existing beliefs about the climate crisis. Selective exposure and biased assimilation combine as mechanisms that widen political divisions on the climate crisis in the U.S., and such mechanisms fit with a reinforcing spirals framework so that partisan media, which consciously design all messages for particular purposes and audiences, strengthen climate crisis beliefs, which then influence subsequent choices of social media.

As demonstration of the effects of climate crisis/denial media information sources on audiences, Petersen, Vincent & Westerling (2019) juxtaposed 386 prominent contrarians with 386 expert scientists by tracking their digital footprints across approximately 200,000 research publications and approximately 100,000 English-language digital and print media articles on climate change. With direct comparison, contrarians were featured in 49% more media articles as a whole than scientists. When their visibility was reduced to solely mainstream media sources only, however, only a 1% excess visibility emerged. The authors suggest that "new media sources" - which in this commentary are referred to as social media - contribute to the production and consumption of climate change disinformation at scale.

Discussion forums, consumer reviews, social posting, microblogging, commenting, group chats, and tweeting are just a sample list of the ways that audiences compose on social media spaces. Newman (2017), in an analysis of active constituents during the summary release of the Working Group 1 Summary for Policymakers of the Intergovernmental Panel on Climate Change Fifth Assessment Report, unpacked the substance of the most propagated tweets and the media sources that attracted the most attention. The results suggest that non-elite actors, such as individual bloggers and concerned citizens, accounted for the majority of the most propagated tweets in the sample, with the most propagated tweets in the sample focusing on public understanding of the report. Finally, while mainstream media sources were the most frequently discussed media

sources, they also found that a number of other social media and science news and information sources compete for audience attention.

NIMBY: A Critical Discourse Analysis

A dirty, expensive fuel, coal has invisible social and environmental costs that affect people's health, the natural environment, and the Earth's climate. According to research conducted by Oil Change International (Bast, 2010), none of the coal power plants funded by the World Bank in the period 2008 to 2010 led to improved energy access for the poor. On the other hand, a Sierra Club (2018) study shows that off-grid decentralized renewable systems can deliver household energy services faster and more cheaply than coal and other centralized generation sources, and decentralized renewable systems can do so without harming health or sacrificing clean air and water.

As Pariser (2012) stated prophetically, "Increasingly online, it's becoming impossible to escape your own point of view." Online personalization, he explained, was a trending radical shift in how people consumed information - so abrupt that it changed and subsequently shaped how people learn, what they know, and how the U.S. democracy works. Media personalization today has tremendous influence on perceptions of the coal industry, and dialectic strategies (Zizek, 2020) might be incorporated to gain clarity about coal. How are coal communities and industries reacting to coal's demise? What social infrastructure assistance might assuage the concerns of coal constituents in an era of coal uncertainty? Can humans continue to burn coal, or is it necessary to remove it from the energy mix and adopt more sustainable energy sources? If so, which ones are preferable, and why? If coal could be altered so it would become carbon neutral, would it then be ethically acceptable?

Yet dialectics do not fully expose the continual change that marks the life of coal from decomposing plant to peat, to pressure of deep burial, to eventual large scale construction of harmful polluting coal-burning electricity-generating plants. Many people wholly support a rapid, if disruptive, transition from coal to a 100% renewable energy in cities and towns. Others who accept the long-term effects of renewable energy also do sometimes waver, unsure about how quickly and effectively the world can adapt to a fossil fuel-free world. Another audience is interested in the benefits, including continued profitability, grid stability, and tradition, of coal and other fossil fuels as energy sources.

Coal as a viable energy source apart from coal propaganda must be self-developed, conceived in an independent state, and, thus, be assessed objectively and logically. Wolfe (2018) defines the ideal of logical thinking as establishing necessary connections between premise and conclusion, beginning and result, thought and being, or proposition and fact. Muhlhausler and Peace (2006) extends the idea of logic to environmental discourses in situated contexts and reason that, most often, arguments for or against coal avoid anthropocentric foundations and are, instead, concerned with the local, which correlates with NIMBYism. This is where critical discourse

analysis can describe audiences as consumers, rhetorical strategies that persuade, and even how simple word choices can have a considerable impact on and shape perceptions of events, so that discussions of coal can take on new meanings.

CleanTechnica is one of many online blogs/ magazines devoted to sustainable energy and transportation. A December 2018 online *CleanTechnica* blog article titled "Coal Is On The Way Out — Gas Is Next" offers insights into how people are negotiating — and sometimes feeling uncertain about — the move away from coal and its cousin, natural gas. In this article, author George Harvey states that coal and gas plants are "being put out of business by lithium-ion batteries, because the energy storage costs, combined with the cost of the electricity from solar and wind plants, are more attractive than the cost of the least expensive fossil fuels." Comments that follow the article dispute and find fault with the author's premise, which invites the interrogation of the multiple layers of discourse around coal and other fossil fuels. This *CleanTechnica* commenting community is presented as a collective with no distinct voices or subgroups. Rarely are commenters placed in a social relationship with each other or in which identities other than "community member" or "participant" are acknowledged. The approach used for this commentary's critical discourse analysis combines rhetorical interrogation, asking what sorts of claims were made and how they were argued for, and reviewing how choices about reactions to dominant discourses around coal were reproduced. Of particular interest is how representations of other voices shape and were shaped by the ideological force of the *CleanTechnica* article (Fairclough, 2012).

Comment (C)1: Gas plants are highly dispatchable, unlike coal, which makes them good fill in for wind and solar.

The word "dispatchable" suggests applicability to transition, in so that gas - often referred to as a "bridge fuel" - continues as an acceptable norm. This type of comment parallels comments emerging from the utility and fossil industries, which are doing their best to dampen the enthusiasm for renewables by injecting what they see as a dose of reality into the drive to get the runaway climate crisis under control.

C2: The next phase will be, "We're vital backup! We're your insurance against power failure!" That one there is a last ditch, although for a decade or so they will probably have a point. After that, outside of isolated facilities or crisis backups, there won't be a market.

Words like "vital backup," "insurance," and "crisis backups" point to a pervasive developed world mindset in which any change must be fully tested, adopted by pilot groups, and assessed against traditional variables of reliability, endurance, and compatibility with existing infrastructure. The global energy transformation necessary to slow and then successfully halt the climate crisis will change power dynamics among nations. Such a global energy transformation concerns many people. Among factors often cited, the type of security arrangements that will be needed to keep the peace among the powers that vie for an energy advantage in the coming renewables era is foremost in many renewable energy opponents' concerns.

C3: We use nearly 25 billion MWh / year of electricity, and we have 127 MHh battery the biggest one as of 2018. We still have a long way to go, and I believe we need a new battery tech. This way we will have to wait until 2100… unless a new storage tech will not be available very soon, we will never get rid of FF, CO2 levels will go down but not as fast as we need.

The issue of intermittency from solar and wind means that reliable power creates a need for energy storage, and many people argue that battery storage is currently not efficient enough to be cost effective or needs traditional fossil fuels or nuclear power as a supplement. The phrases "still have a long way to go," "not be available very soon," and "not as fast as we need" all have an underlying component of fear.

Csikszentmihalyi (2002) calls this an interruption of "flow," in which individuals who are thrust into new and unfamiliar situations respond by inertia or shutting down. The switch away from coal and other fossil fuels to renewable energy, which has significant energy storage needs to compensate for times when sun or wind is not available, requires substantial consumer education, capacity increases through extensive federal and corporate funding, and a new developed nations' mindset where change embodied with climate action is admirable, embraced, and freeing.

C4: We can install far more wind and solar now, if people wanted it, yet in Germany prefer their coal.

Today, nearly a quarter of all electricity produced in Germany still comes from burning lignite, often called brown coal - one of the dirtiest fossil fuels - making Germany the world's leader in the mining and burning of lignite. Chancellor Angela Merkel is faced with mounting challenges, including from the far right, in eastern regions where a bulk of those jobs would be lost if coal is replaced by renewable energy. The far-right Alternative for Germany, the leading opposition party, has questioned the veracity of Germany's national consensus on the role humans play in contributing to climate change.

Qualifying progress toward renewable energy as available "now" but only "if people wanted it" shifts the responsibility from fossil fuel billionaires to individual consumers. Certainly, individuals can find voice and mitigate their carbon footprints in overt social discourse and lifestyle behaviors. However, smatterings of individual impacts would take generations, and, according to the UNPCC, the world's population only has 11 years to make substantive reductions to carbon emissions to avoid crossing a carbon threshold from which there is no return. Coal and other fossil fuel emitters must be legislated into extinction by countries like Germany, albeit at short term financial losses as the transition to renewable energy takes place.

C5: Fortunately for gas plant owners, the plants are fairly cheap.

While natural gas may have been inexpensive in the past, a recent report reveals 42% of global coal capacity is currently unprofitable, and the U.S. could save $78 billion by closing coal-fired

power plants, which is in line with the Paris Climate Accord's climate goals. This industry-disrupting trend will become more evident as the cost of renewable energy dips below the cost of fossil fuel generation. The word "fortunately" connotes a type of neoliberal rationalization, as if the generation of carbon-based energy is a good thing for corporate entities due to their fiscal bottom line as "fairly cheap." Absent is a discussion of fossil fuel billionaires' complicity in the climate crisis.

C6: I guess domestic heating will be the last bastion of the FF industry.

For many living in cold weather climates, the short-term goal is not zero fossil fuels, though most advocates state that this would be an eventual long-term objective. They see the tremendous concentration of energy in liquid fossil fuels as a reliable back-up system, with small steps taken annually to replace boilers with solar, for example, or as a fallback for when the renewables need compensation.

C7: And shipping and long distance air travel. Unfortunately.

It is clear that the shipping and air industries need to move to renewable and alternative fuels to reduce the sector's impact on the environment to reduce local pollutants, comply with regulation, mitigate against climate change, and cut greenhouse gas emissions. Alternative fuels often assessed are liquefied natural gas (LNG), methanol, liquid hydrogen (LH2) (with and without carbon capture and storage), biodiesel, straight vegetable oil (SVO), and bio-LNG. Right now, it seems as if there is no widely available fuel to mitigate the climate crisis and local pollutants.

Discussion

Formerly respected sources of information such as peer-reviewed scientific research are no longer necessarily perceived as reliable resources to discern the physical nature of Earth. One reason for this pervasive lack of scientific trust arises from the influence of algorithmic personalization of social media channels. Pariser (2012) argues that algorithmic agents contribute to superficiality of news and research sources, fail to recognize and serve complex user profiles, and disregard preferences such as users' desire for diverse or in-depth news. As a result, social networks reinforce selective exposure to views and information, confirm pre-existing beliefs, and reduce tolerance for alternative viewpoints.

While scientific consensus agrees that it is essential to take climate action now, algorithmic personalization leaks into mental models and influences NIMBYism. NIMBY logic prevails when corporations spin climate policies in terms that redirect corporate coal profitability concerns to local significance. Immediate reduction in carbon emissions from coal plant closures, for example, would significantly reshape the US national economy through a new energy sector, new industrial practices, and new approaches to agriculture and transportation. The NIMBY principle, even taking into account that individuals are honestly attempting to protect neighborhoods and communities, can prevent the construction of new environmentally sound

sites absent of coal mining chemicals and residues. The invisibility of coal's massive pollution sets up barriers where impacts such as mercury contamination, asthma rates, acidification of the oceans, and carbon emissions are often portrayed as fake news. Moreover, pro-coal lobbyists have maneuvered social action into NIMBY intransigence about renewables, so that clean energy options that would create positive impacts for citizens and their communities are stalled. Why? Fossil fuel industry think tanks like Americans for Prosperity and Crossroads GPS reject the clear scientific consensus that the US needs to completely decarbonize — get to net-zero carbon emissions — by the middle of the 21st century. Nowhere in the coal industry's discussion is the recognition that renewable energy has grown into a mature industry and, as a much less risky financial venture than ever before, is attracting investments that rival the capacity of conventional power plants. Protests against eliminating coal are attempts to express true conflicts of incommensurable values. Understanding the position of pro-coal constituents will help renewable energy advocates to better address NIMBY concerns and overcome renewable energy opposition. Value conflicts can often be resolved through stakeholder engagement and adhering to good standards of procedural justice (Schwenkenbecher, 2017).

Offering cost-effective clean power can directly offset some of the dirtiest electricity sources in the US, yet it requires finding a space where important meanings-making can occur. Media literacy education that targets the dominant symbolic representations of coal and the relationship between opposition and locality should be pursued in all areas where formal learning takes place. Media literacy education has the capacity to reframe ideological positions on both sides of the coal conflict; for example, Hager (2017) demonstrates how NIMBY protests can be beneficial components of participatory politics that result in social, political, and technological innovation. Indeed, Hager describes how networks established during a conflict can "persevere and grow, sharing experiences and information that support more effective citizen participation in the future" (p. 2). Through the analysis of the structure of the opposition movement and its changes over time, Sebastien (2016) shows how media literacy can foster social movements that enrich democracy through the constitution of four types of capital: social, scientific, patrimonial, and political.

Discourses are important factors in explaining change. Commenters on the *CleanTechnica* article seem recalcitrant in that they interpret natural gas as an adequate substitution for coal rather than taking the next and more far-reaching step toward renewable energy full replacement. These commenters stood firm that coal will continue to be an insurance policy as the transition to renewable energy occurs. Renewable energy intermittency became such a distraction that commenters acquiesced that coal must continue to be in the energy mix or the world would face unacceptable energy shortages. Relating to people in regions where coal is abundant and creates career stability, some commenters went so far as to suggest that people in such areas actually prefer it over other energy choices. These commenters failed to gain critical distance and see how powerful coal companies target them as audiences through strategic propaganda and algorithmic personalization. As a result, some commenters surmised that energy costs will continue to be, for the foreseeable future, the primary motivation for people's energy choices. Some commenters went so far as to deduce that some types of energy needs, like home heating

oil, are so problematic that they cannot be replaced with renewable sources. Coal even became intertwined with other areas of high carbon emission like air travel, so that the complications of one area would seem to muddy tentative solutions of the other.

Conclusion

If "culture" is a system of shared beliefs, then "mental models" are ways of thinking about the world. The world in which each person lives seems "normal," as if each life experience is so typical that everyone else must also have these same ways of looking at the world. Of course, each life experience is actually singular and rare. And nowhere is that more evident than in climate crisis discussions. When individuals talk about typical climate crisis topics, such as coal's place in the energy mix, they draw upon different cultural models and domains. Understanding the cultural and mental models that an audience brings to climate crisis controversies is crucial as a beginning step to multidimensional climate mitigation messaging (Fortuna, 2018). Media literacy education is a way to transcend entrenched cultural mental models, as media literacy education provides a framework for obtaining a "repertoire of knowledge, skills, and dispositions that can be technologically sophisticated, pedagogically rigorous, and democratic by design," according to Domine (2011, p. 195).

Many cultural models aren't consistent with the science of anthropogenic climate change nor the behaviors necessary to protect the planet from additional greenhouse gas emissions. Because of the unprecedented profusion of visual information across social media in today's contemporary post-truth era, media literacy can illuminate fake news and uncritical consumption of the media. Cultural models structure everyday thinking and actions, and, as the climate crisis is a complex issue where various subject areas such as science, health, environment, economy, human development, public policy, and foreign relations intersect, acknowledging the existential crisis that humans face through media literacy education is essential. Individuals of entirely disparate positions on the energy mix can benefit from deconstructing media messages and corporate marketing decisions.

Indeed, as concerns grow about the spread of misinformation through social media, it is time to improve the public's media literacy capacity as one answer to the prevalence of fake climate crisis news. Social media use is an important area within climate communication. Because it has both expressive (offering opinions/ information) and consumptive (absorbing messages) functions, social media can foster democratic processes and the creation of social capital. However, the consumptive aspect of social media is generally considered to be more passive, with users seemingly culpable for absorbing news and information with disinterest and lack of critical analysis (Fortuna, 2017). Individuals' perceptions about the news and issues in the news are sometimes associated with the comments that audiences make in reaction to social news stories, which can take on their own life and tenor. Information filtered through social media is such a personalizing experience that it brings the climate crisis closer to individuals — with many consequences (Fortuna, 2017).

Understanding coal propaganda and its influence on the U.S. energy mix requires all parties to become aware of propaganda present in today's social media and of the potential of algorithms and personalized learning to transform the way audiences interpret media messages. In what is being termed "pedagogies of defamiliarization" (Hobbs, 2020), new strategies can help individuals to gain greater awareness of algorithmic personalization. This starts by recognizing that groups in the algorithmic era are much more liquid, transforming according to data inputs and users' behavior (Soffer, 2019). Empowering all groups with a "nuanced appreciation of how algorithmic personalization and propaganda may benefit individuals and societies" (Hobbs, 2020, p.14) can inject awareness of the disparate realities of persuasive genre. These disparate realities are triggered by activation of emotion, deep immersion in particular worldviews, and highly refined artistic designs. Climate change advocates know how important it is to connect with audiences through effective messaging. Future research and application should include media literacy curricula like those available at Project Look Sharp and the Media Education Lab. As educators and students cry out for curricula that encompass more relevant, hands-on lessons and stronger instruction on climate change and the environment (Fortuna, Clapp, Unger, & Larrañaga, 2020, in press), media literacy scholars can help by providing strategies to unpack contemporary propaganda and algorithmic personalization in areas like coal and other fossil fuels. In turn, because social media algorithms are primarily based on engagement, when people learn to frequently like, share, and click posts about the importance of the climate crisis, stronger correlations among social networks will result and make the climate crisis and renewable energy solutions more transparent among social media users - even those with NIMBYism.

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