

October 2017

## A Viewer's Guide to NatGeo's *From the Ashes*: Why It Belongs in the Ashes

By James H. Rust and Edward Hudgins\*

### Introduction

National Geographic Television is featuring a documentary titled *From the Ashes* that highlights alleged environmental damage from the use of coal as a fuel.<sup>1</sup> You can catch it on the NatGeo Channel and on most video services.

In the past, *National Geographic* magazine introduced generations to the wonders of the natural world, and its TV programs were the standard of quality by which all television was judged. No more.

In the spirit of the *National Geographic* of old, here is a guide to help perplexed viewers of *From the Ashes* separate fact from fiction.

*From the Ashes* offers an out-of-context and inaccurate perspective that will mislead rather than enlighten minds about the history and future of one of the country's most abundant energy resources. One image from *Ashes* is a metaphor for the whole program: We see a power plant smokestack emitting white clouds. Choking, poisonous fumes, as the theme of the program might imply? No: Nearly all of the "smoke" and virtually all that is visible is harmless water vapor.

Here, therefore, in the spirit of the *National Geographic* of old, is a guide to help perplexed viewers separate fact from fiction. This *Policy Brief* will make seven crucial points:

---

\* James H. Rust, now retired, was professor of nuclear engineering at the Georgia Institute of Technology. Edward Hudgins is research director for The Heartland Institute. For more complete bios, see page 15.

© 2017 The Heartland Institute. Nothing in this report should be construed as supporting or opposing any proposed or pending legislation, or as necessarily reflecting the views of The Heartland Institute.

<sup>1</sup> *From the Ashes*, National Geographic Channel, 2017, <http://channel.nationalgeographic.com/from-the-ashes/video-gallery/>.

1. The provenance of *Ashes* suggests it is highly biased.
2. Carbon dioxide is not “pollution.”
3. The international war on coal is a war on prosperity.
4. Using clean coal is not creating an ozone problem.
5. Using clean coal is not a major cause of asthma.
6. Renewable energy cannot economically replace coal.
7. Renewables are not so clean.

## 1. The provenance of *Ashes* suggests it is highly biased

A review of the program in *Variety*<sup>2</sup> should raise the suspicions of viewers about the veracity of the documentary: “The film is part of Michael Bloomberg’s environmental efforts, which have included a commitment of more than \$100 million via Bloomberg Philanthropies to move the U.S. away from coal and toward clean energy.” Bloomberg has a long history of supporting anti-coal activities, including donating \$80 million<sup>3</sup> to the Sierra Club’s “Beyond Coal” project, which promotes *From the Ashes*.<sup>4</sup>

The Sierra Club played a major part in the production of *From the Ashes*. With this pedigree, one should certainly doubt whether *Ashes* will be fair and balanced.

The Sierra Club played a major part in the production of *From the Ashes*. A frequent commentator in the film is Carl Pope, who spent more than 30 years with that organization, including stints as its executive director and chairman. Other Sierra Club advocates speak throughout

the production. Fundraising letters featuring the global warming scare, with coal and carbon dioxide as the principal villains, are a major source of funds for the Sierra Club. Members usually receive a daily e-mail asking for donations to fight climate change or fossil fuels.

If National Geographic wanted to produce a fair and balanced documentary about fossil fuels, it would not have partnered with Michael Bloomberg or the Sierra Club. Ideological bias and a financial conflict of interest preclude this film from being a reliable source of information on a controversial topic.

## 2. Carbon dioxide is not “pollution”

Viewers should beware of the very language used in *From the Ashes*. For example, it refers to carbon dioxide as “carbon pollution.” The intent clearly is to mislead viewers, since carbon dioxide (CO<sub>2</sub>) is an invisible, odorless, and harmless trace gas that does not meet most

<sup>2</sup> Dave McNary, “National Geographic Grabs Tribeca Documentary ‘From the Ashes,’” *Variety*, April 13, 2017, <http://variety.com/2017/film/news/tribeca-national-geographic-coal-mining-documentary-from-the-ashes-1202029979/>.

<sup>3</sup> “Bloomberg Philanthropies Boosts Investment in Sierra Club to Retire U.S. Coal Fleet & Transition the Nation towards Clean Energy Sources,” The Sierra Club, April 8, 2015, <http://content.sierraclub.org/press-releases/2015/04/bloomberg-philanthropies-boosts-investment-sierra-club-retire-us-coal-fleet>.

<sup>4</sup> *Beyond Coal* (website), Sierra Club, <http://content.sierraclub.org/coal/>.

definitions of “pollution.” The U.S. Supreme Court ruled CO<sub>2</sub> meets the legal definition of a “pollutant” under the Clean Air Act only because anything, however benign or malignant, that is added to the air or water can be regulated by the U.S. Environmental Protection Agency (EPA).

Misnaming CO<sub>2</sub> “carbon” invokes images of ashes, soot, and even chunks of coal. This is a propaganda tactic, used by President Barack Obama’s EPA, that should not appear in a film claiming to be based on science.<sup>5</sup>

Far from being a pollutant, CO<sub>2</sub> is a naturally occurring gas that has been in the atmosphere for hundreds of millions of years, well before humans walked the planet. It is necessary for the cycle of life on Earth. We can correctly call it “airborne fertilizer” because it is necessary for the survival and growth of all plants. Dr. Craig Idso of the Center for the Study of Carbon Dioxide and Global Change, in a video titled “Carbon Dioxide: Benefiting the Biosphere,” explains the value of CO<sub>2</sub> and rightly calls it “the elixir of life.”<sup>6</sup>

Thousands of studies have shown how higher concentrations of CO<sub>2</sub> in the air increase crop yields and the size of plant root systems and leaf stomata, making plants more drought resistant. One report placed the social benefits of CO<sub>2</sub> for agriculture alone at \$3.2 trillion from 1960 to 2012.<sup>7</sup> Benefits from 2012 to 2050 are estimated to be \$7.9 trillion. The

The increase in atmospheric CO<sub>2</sub> from 310 parts per million (ppm) in 1950 to 406 ppm today played a major role in increasing the planet’s capacity to feed a human population that increased from 2.5 billion in 1950 to 7.5 billion in 2017.

increase in atmospheric CO<sub>2</sub> from 310 parts per million (ppm) in 1950 to 406 ppm today played a major role in increasing the planet’s capacity to feed a human population that increased from 2.5 billion in 1950 to 7.5 billion in 2017—five billion additional individuals better fed than at any time in human history.

*From the Ashes* often repeats the claim that 20 individuals per day, or 7,500 per year, die from pollution due to burning coal to generate electricity. *From the Ashes* does not tell us where this number comes from. It is in fact a fake number.

The number comes from the Clean Air Task Force (CATF), a private advocacy group fighting fossil fuels. The group generates the death numbers by making assumptions about the effects of soot or small-sized fine “particulate matter” (PM<sub>2.5</sub>) emitted by power plants. In 2006, air quality researcher Joel Schwartz documented how CATF’s 2000 report<sup>8</sup> ignored much scientific research showing PM<sub>2.5</sub> has little or no effect on health or mortality, and only about one-third of

---

<sup>5</sup> Nicolas Loris, “EPA Formally Declares CO<sub>2</sub> a Dangerous Pollutant,” *Daily Signal*, December 7, 2009, <http://dailysignal.com/2009/12/07/epa-formally-declares-co2-a-dangerous-pollutant/>.

<sup>6</sup> Craig Idso, “Carbon Dioxide: Benefiting the Biosphere,” YouTube video, October 4, 2017, <https://www.youtube.com/watch?v=GTelkNud25I>.

<sup>7</sup> Roger Bezdek, “The Social Costs of Carbon? No, the Social Benefits of Carbon,” American Coalition for Clean Coal Electricity, January 2014, p. 10, <http://misi-net.com/publications/CarbonBenefits-0114.pdf>.

<sup>8</sup> Abt Associates Inc., “The Particulate-Related Health Benefits of Reducing Power Plant Emissions,” Clean Air Task Force, October 2000; available at <http://cta.policy.net/fact/mortality/mortalityabt.pdf>.

PM<sub>2.5</sub> emissions come from power plants.<sup>9</sup> CATF ignored a study in the journal *Regulatory Toxicology and Pharmacology* that found “no form of ambient PM has been shown, experimentally or clinically, to cause disease or death at concentrations remotely close to U.S. ambient levels.”<sup>10</sup>

What if, despite compelling scientific research to the contrary, it were the case that burning fossil fuels caused premature deaths due to air pollution? This would make fossil fuels no different than most other technologies that involve risks and costs yet are deemed worthwhile because of their enormous offsetting benefits. For example, in the United States there are 110 deaths per day, more than 40,000 annually, from automobile accidents.<sup>11</sup> All are tragedies. Yet each of the 262 million vehicles<sup>12</sup> in the United States on average travels 12,000 miles per year. This means one fatality every 80 million miles traveled. As a society, we have made the decision that the benefits of fast and affordable travel override this slight risk of a fatality.

*From the Ashes* also fails to explore the harm that would be done if energy prices rose because inexpensive coal or other fossil fuels were eliminated in favor of pricy alternatives.

*From the Ashes* also fails to explore the harm that would be done if energy prices rose because inexpensive coal or other fossil fuels were eliminated in favor of pricy alternatives. Higher electricity prices can cause the less fortunate to forgo heating in the winter and air conditioning in the summer. One study of “energy

poverty” estimated “54 million European citizens (10.8% of the EU population) were unable to keep their home adequately warm in 2012.”<sup>13</sup> At the other end of the temperature spectrum, during one heat wave, the report noted, there was a high “mortality rate growth among low income households and vulnerable people. It was estimated that 80,000 people died in the 2003 summer in Europe, one fourth in Italy ...” In France, 15,000 people died during that heat wave.<sup>14</sup> Inexpensive energy running inexpensive air conditioners could have saved those lives. High energy costs endangered them. No mention of this appears in *Ashes*.

<sup>9</sup> Joel Schwartz, “Facts Not Fear on Air Pollution,” National Center for Policy Analysis, December 2006, <http://www.ncpa.org/pdfs/st294.pdf>.

<sup>10</sup> Laura Green and Sarah Armstrong, “Particulate Matter in Ambient Air and Mortality: Toxicologic Perspectives,” *Regulatory Toxicology and Pharmacology* 38, no. 3 (December 2003), <http://www.sciencedirect.com/science/journal/02732300/38?sd=1>.

<sup>11</sup> “Motor Vehicle Deaths up 6% in 2016,” *NSC Motor Vehicle Fatality Estimates*, National Safety Council, 2017, <http://www.nsc.org/NewsDocuments/2017/12-month-estimates.pdf>.

<sup>12</sup> “United States Vehicle Ownership Data, Automobile Statistics and Trends,” Hedges and Company, 2017, <https://hedgescompany.com/automotive-market-research-statistics/auto-mailing-lists-and-marketing>.

<sup>13</sup> Steve Pye, Audrey Dobbins, *et al.*, “Energy Poverty and Vulnerable Consumers in the Energy Sector Across the EU: Analysis of Policies and Measures,” *Policy Report 2*, Insight\_E, May 2015, [https://ec.europa.eu/energy/sites/ener/files/documents/INSIGHT\\_E\\_Energy%20Poverty%20-%20Main%20Report\\_FINAL.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/INSIGHT_E_Energy%20Poverty%20-%20Main%20Report_FINAL.pdf).

<sup>14</sup> Edward Hudgins, “France’s Killer Collectivism,” *The Atlas Society*, March 18, 2003, <https://atlassociety.org/commentary/commentary-blog/3508-france-s-killer-collectivism>.

Another study found, “Between 1900 and 2000 there were 65,838 heat related deaths in the United States” and “Heat-related fatalities decline after WWII – as air conditioning becomes more affordable.”<sup>15</sup>

*From the Ashes* makes no attempt to consider the hardships people currently suffer because of high energy costs, often the result of cutting back on fossil fuel use, much less the future hardships from abandoning fossil fuels in order to eliminate so-called “carbon pollution.”

### 3. The international war on coal is a war on prosperity

*From the Ashes* mentions President Donald Trump pledged to withdraw the United States from the Paris Climate Accord. After production on the program wrapped up in early 2017, but before its broadcast, Trump did just that. Viewers who look beyond *From the Ashes* will understand the country has dodged a bullet rather than been damned to a dire future.

The accord was not a treaty ratified by Congress as required by the Constitution. Rather, Obama adopted it by executive order. Under the accord, the United States had pledged to reduce CO<sub>2</sub> emissions by up to 28 percent between 2005 and 2025. The accord also established a Green Climate Fund requiring developed nations to contribute \$100 billion annually, starting in 2020.

*From the Ashes* touts the fact 195 nations signed on to the accord but fails to acknowledge that the accord requires only the United States and other industrialized nations to actually reduce their CO<sub>2</sub> emissions. China and India, the world’s first and third largest CO<sub>2</sub> emitters, and more than 150 other nations don’t have to begin reducing CO<sub>2</sub> emissions until 2030.

*From the Ashes* says little about the costs to the economy and to the living standards of citizens in the industrialized countries burdened with the accord. The accord would make it increasingly difficult for Americans to develop and use abundant, inexpensive coal, oil, and natural gas.

China and India, the world’s first and third largest CO<sub>2</sub> emitters, and more than 150 other nations don’t have to begin reducing CO<sub>2</sub> emissions until 2030.

Billions of American taxpayer dollars would be spent on renewable energy sources such as solar, wind, ethanol from corn, and other biofuels, all of which are unreliable, expensive, and create severe environmental problems.

The Green Climate Fund will pay developing nations to build renewable energy sources and mitigate the effects of climate change. China and India expect to receive some of these funds. The U.S. payment to the fund likely would have been about \$22 billion annually.<sup>16</sup> Withdrawal from the accord means that money can stay in the pockets of American taxpayers.

---

<sup>15</sup> Karl K. Leiker, “Heat Waves and Heat Mortality in the United States During the Twentieth Century,” 15th Conference on Biometeorology/Aerobiology and 16th International Congress of Biometeorology, October 30, 2002, [https://ams.confex.com/ams/15BioAero/techprogram/paper\\_49534.htm](https://ams.confex.com/ams/15BioAero/techprogram/paper_49534.htm).

<sup>16</sup> The United States contributes 22 percent of the United Nations’ operating budget. It was expected the United States would pay a similar share of the Green Climate Fund bill, or about \$22 billion.

High praise for the accord comes from Christiana Figueres, executive secretary of the United Nations Framework Convention on Climate Change (UNFCCC), which figured heavily in the creation of the accord. She and *From the Ashes* financier Bloomberg are close allies. *From the Ashes* adroitly avoids discussing Figueres' political agenda. At a 2015 press conference in Brussels, she said, "This is the first time in the history of mankind that we are setting ourselves the task of intentionally, within a defined period of time, to change the economic development model that has been reigning for at least 150 years, since the industrial revolution."<sup>17</sup>

The economic development model to which she is referring is, of course, *capitalism*, the goal of which is to empower individuals with the liberty to pursue their individual prosperity by producing goods and services to trade voluntarily with one another. That free-market system has resulted in more wealth creation than in the entire history of humanity before that time. Billions of people live longer, healthier lives.

The Paris Accord would not simply tweak economies in the name of protecting the environment; it would smash free economies and damn millions to declining living standards and poverty.

By rejecting capitalism, Figueres essentially is declaring her rejection of the values of prosperity and individual liberty. The Paris Accord would not simply tweak economies in the name of protecting the environment; it would smash free economies and damn millions of people to declining living standards and

poverty in the name of heading off a highly uncertain future danger about which the science is anything but settled.

#### 4. Using clean coal is not creating an ozone problem

Midway through *From the Ashes* the viewer is shown a map of Texas with a string of coal-fired power plants around the Dallas area. The program alleges that burning coal causes ozone pollution in Dallas, harming human health. It makes no mention of other sources of ozone, although there is plenty of research available on this point.

- A 2009 report by Stanford University researchers was headlined, "Ethanol results in higher ozone concentrations than gasoline."<sup>18</sup>
- A 2011 report by the National Academies of Sciences, Engineering, and Medicine<sup>19</sup> confirmed using ethanol as a fuel creates ozone problems.

---

<sup>17</sup> "Figueres: First Time the World Economy is Transformed Intentionally," United National Regional Information Centre for Western Europe, February 3, 2015, <http://www.unric.org/en/latest-un-buzz/29623-figueres-first-time-the-world-economy-is-transformed-intentionally>.

<sup>18</sup> Louis Bergeron, "Stanford Researchers: Ethanol Results in Higher Ozone Concentrations than Gasoline," *Stanford News*, December 14, 2009, <http://news.stanford.edu/news/2009/december14/ozone-ethanol-health-121409.html>.

<sup>19</sup> "Environmental Effects and Tradeoffs of Biofuels," *Renewable Fuel Standard: Potential Economic and Environmental Effects of U.S. Biofuel Policy (2011)*, Washington, DC: The National Academies of Sciences, Engineering, and Medicine, 2011, <https://www.nap.edu/read/13105/chapter/7#262>.



- A 2013 *Nature Geoscience* article<sup>20</sup> explained local ozone levels in urban Sao Paulo, Brazil, fell after drivers shifted from ethanol to gasoline use. Forty percent of automobiles in Sao Paulo are flex-fueled and can run on ethanol or gasoline. When ethanol was more expensive than gasoline, the percentage of flex-fueled vehicles using gasoline rose from 14 percent to 76 percent, and ozone pollution dropped 20 percent.

Many environmentalists favor government mandates that ethanol be mixed with gasoline because ethanol is produced from renewable crops like corn. *From the Ashes* might have looked to evidence from Sao Paulo before offering an out-of-context accusation about the source of ozone in Dallas.

Research also calls into question the impact of ozone on human health, a scientific debate taking place that *From the Ashes* ignores and hides from viewers.

Research also calls into question the impact of ozone on human health, a scientific debate taking place that *From the Ashes* ignores and hides from viewers.

A 2002 study by the California Air Resources Board found higher ozone levels in part of that state were associated with fewer health problems.<sup>21</sup> EPA refuses to reveal the raw data used in epidemiological studies it claims support its case for regulating ozone and particulate matter (addressed below). Agency spokespersons have admitted in congressional testimony the agency doesn't have access to the raw data and so has not conducted independent analysis of it.<sup>22</sup>

In 2013, the House Science Committee issued a subpoena to the agency in an attempt to get independent scholars access to data to check EPA's science. The committee reported, "by its own estimates the EPA's proposed limits on ozone will cost taxpayers \$90 billion per year, making it the most costly regulation the federal government has ever issued. Some of the data in question is up to 30-years-old." Congressman Lamar Smith (R-TN), the committee's chairman, said, "The American people deserve all of the facts and have a right to know whether the EPA is using good science."<sup>23</sup>

<sup>20</sup> Alberto Salvo and Franz M. Geiger, "Reduction in Local Ozone Levels in Urban São Paulo Due to a Shift from Ethanol to Gasoline Use," *Nature Geoscience*, October 2, 2013, <http://www.nature.com/ngeo/journal/v7/n6/full/ngeo2144.html>.

<sup>21</sup> Stephen K. Van Den Eeden, et al., *Particulate Air Pollution and Morbidity in the California Central Valley: A High Particulate Pollution Region*, California Air Resources Board, July 12, 2002, <http://www.arb.ca.gov/research/apr/past/97-303.pdf>.

<sup>22</sup> James M. Taylor, "The Black Box: EPA defies Congress on 'secret science' used to justify environmental regulations," *Green Watch*, November 2013, <https://capitalresearch.org/article/green-watch-november-2013-the-black-box-epa-defies-congress-on-secret-science-used-to-justify-environmental-regulations/>.

<sup>23</sup> *Ibid.*

## 5. Using clean coal is not a major cause of asthma

*From the Ashes* returns to Dallas for an interview with the mother of a child afflicted with asthma. The program suggests burning coal caused the problem. But the relationship between fossil fuels and asthma is also controversial at best, another debate hidden from viewers. The inclusion of this topic in the program probably had its origin once again in the propaganda campaign waged against fossil fuels by the Obama administration.

In a March 18, 2009 three-page email with the subject line “Strategic Communications Conversation,”<sup>24</sup> sent to “Richard Windsor,” a pseudonym for EPA Administrator Lisa Jackson, EPA’s Allyn Brooks-LaSure pointed out, “The number of Americans who say the global warming threat has been exaggerated is at an all-time high.” He suggested, “if we shift from making this about polar caps and [to making it] about our neighbor with respiratory illness we can potentially bring this issue to many Americans.”

President Barack Obama often used fear of asthma to support his efforts to curtail use of fossil fuels.

Obama subsequently often used fear of asthma to support his efforts to curtail use of fossil fuels. In 2014, as part of that strategy, he visited an asthma ward at the Children’s National Medical Center in Washington, DC, and at an appearance at

West Point he claimed, “just in the first year the [Clean Power Plan] would reduce asthma attacks by 100,000 and heart attacks by 2,100.”<sup>25</sup>

A 2014 White House report asserted, “Climate change, caused primarily by carbon pollution threatens the health and well-being of Americans in many ways, from increasing the risk of asthma attacks and other respiratory illnesses to changing the spread of certain vector-borne diseases.”<sup>26</sup> On April 7, 2015, in an ABC television interview, Obama mentioned that 12 years earlier his then-four-year-old daughter had to be rushed to an emergency room due to an asthma attack.<sup>27</sup> Obama failed to reflect on the fact that he was a heavy smoker at that time, and that indoor smoking is a contributor to asthma attacks.

If *From the Ashes* had moved beyond the rhetoric and looked to the facts about asthma, it would have told a different story. A WebMD article explains asthma symptoms have many causes, noting, “Eighty percent of people with asthma have allergies to airborne substances such as tree,

---

<sup>24</sup> Allyn Brooks-LaSure, “Strategic Communications Conversation,” March 18, 2009, obtained by the Competitive Enterprise Institute under the Freedom of Information Act, <https://wattsupwiththat.files.wordpress.com/2015/01/march-09-epa-strategy-memo-to-lpj.pdf>.

<sup>25</sup> Susanne Goldenberg, “Obama Heralds Health Benefits of Climate Plan to Cut Power Plant Emissions,” *The Guardian*, May 31, 2014, <https://www.theguardian.com/world/2014/may/31/obama-climate-change-epa-power-plant-health>.

<sup>26</sup> “The Health Impacts of Climate Change on Americans,” June 2014, [https://obamawhitehouse.archives.gov/sites/default/files/docs/the\\_health\\_impacts\\_of\\_climate\\_change\\_on\\_americans\\_final.pdf](https://obamawhitehouse.archives.gov/sites/default/files/docs/the_health_impacts_of_climate_change_on_americans_final.pdf).

<sup>27</sup> Liz Neporent, “Obama Says Climate Change’s Impact on Health Is Personal for Him,” ABC News, April 7, 2015, <http://abcnews.go.com/Health/obama-climate-impact-health-personal/story?id=30141591>.



grass, and weed pollens, mold, animal dander, dust mites, and cockroach particles.”<sup>28</sup> No mention of global warming or the byproducts of fossil fuel combustion.

University of Georgia Emeritus Professor R. Harold Brown, in an article titled “Politics of asthma have outrun the science of the condition,” suggested there is a *negative* correlation between asthma attacks and peak eight-hour ozone concentrations. He writes,

A global report on asthma in 2004 cited prevalence for asthma symptoms for U.S. adults as 10.9 percent, but 2.1 percent for China and 2.2 percent for Russia, countries not known for their clean air. A 2001–2004 ... [Centers for Disease Control] survey showed 14.6 percent of U.S.-born women reported that they had ever had asthma vs. 4 percent of women born in Mexico, and 6.8 percent for immigrants born elsewhere claimed they had asthma.<sup>29</sup>

An Institute for Energy Research study in 2015, “Five Charts That Blow Apart EPA’s Asthma Claims,” showed a 131 percent increase in child asthma from 1980 to 2014 in the United States. During that period of time, all forms of pollution decreased.<sup>30</sup>

Air quality today in the United States is much better than it was in 1950, yet asthma rates are higher today than they were then. Asthma rates in the United States are also higher than rates in countries with far worse air pollution. *From the Ashes* doesn’t bother its viewers with these inconvenient facts, and excluding them defines this film as propaganda rather than educational.

Asthma can be a life-threatening health condition, but it is disingenuous and counterproductive to blame asthma on coal, CO<sub>2</sub>, ozone, particulate matter, or global warming.

Asthma can be a life-threatening health condition, but it is disingenuous and counterproductive to blame asthma on coal, CO<sub>2</sub>, ozone, particulate matter, or global warming. The more policymakers focus on the wrong causes, the less likely the medical community is to find a solution.

## 6. Renewable energy cannot economically replace coal

*From the Ashes* touts solar and wind power as replacements for coal for electricity generation. The program again focuses on Texas, this time the town of Georgetown, located in the middle of the string of coal-fired power plants. *From the Ashes* reports the town has 20- to 25-year power purchase agreements for all its electricity from renewable sources. The program

<sup>28</sup> “Asthma Causes and Triggers,” WebMD (website), <http://www.webmd.com/asthma/guide/asthma-triggers#1>.

<sup>29</sup> R. Harold Brown, “Politics of Asthma Have Outrun the Science of the Condition,” *Atlanta Journal-Constitution*, July 11, 2011, <http://www.ajc.com/news/opinion/politics-asthma-have-outrun-the-science-the-condition/fksa1pex3suO7ldT7pUqyl/>.

<sup>30</sup> “Five Charts that Blow Apart EPA’s Asthma Claims,” Institute for Energy Research, July 22, 2015, <http://instituteforenergyresearch.org/analysis/five-charts-that-blow-apart-epas-asthma-claims/>.

makes no mention of electricity rates for the town's residents or taxpayer-funded subsidies for renewable energy sources.

In a 2014 article in *Proceedings of the National Academy of Sciences* much-heralded in the environmental movement, Stanford University professor Mark Jacobson and his co-authors asserted it would be feasible to power the American economy by midcentury almost entirely with energy from the wind, the sun, and water. They also asserted doing so would be less expensive than running the economy on fossil fuels.<sup>31</sup> Those assertions, probably the basis for the claims and assumptions that appear in *From the Ashes*, were thoroughly debunked in a 2017 article in the same journal written by 21 prominent scholars, including physicists, engineers, and climate scientists. They concluded:

[T]his work used invalid modeling tools, contained modeling errors, and made implausible and inadequately supported assumptions. Policy makers should treat with caution any visions of a rapid, reliable, and low-cost transition to entire energy systems that relies almost exclusively on wind, solar, and hydroelectric power.<sup>32</sup>

Policy makers should treat with caution any visions of a rapid, reliable, and low-cost transition to entire energy systems that relies almost exclusively on wind, solar, and hydroelectric power.

David Victor of the University of California San Diego, one of the critics of the Jacobson paper, commented, "I had largely ignored the papers arguing that doing all with renewables was possible at negative costs because they struck me as obviously incorrect."<sup>33</sup> He added, "But when policy makers started using [the Jacobson] paper for scientific support, I thought, 'this paper is dangerous.'"<sup>34</sup>

Renewables for transportation fare no better, a fact ignored by *From the Ashes*. Consider, for example, some quick math about ethanol from corn, used as a gasoline additive:

- Ethanol has 70 percent of the energy content of gasoline. A car getting 30 miles per gallon on gasoline gets 21 miles per gallon on ethanol.
- Americans are driving 264 million cars and light trucks each using 500 gallons per year of gasoline, or 132 billion gallons. The equivalent ethanol is 188 billion gallons.
- The yield today for ethanol is 420 gallons per acre. To produce 188 billion gallons of ethanol would require 448 million acres of farmland.

<sup>31</sup> Mark Z. Jacobson, Mary A. Cameron, and Bethany A. Frew, "Low-cost Solution to the Grid Reliability Problem with 100% Penetration of Intermittent Wind, Water, and Solar for All Purposes," *Proceedings of the National Academy of Sciences*, May 26, 2015, <http://www.pnas.org/content/112/49/15060>.

<sup>32</sup> Christopher T. M. Clack, *et al.*, "Evaluation of a Proposal for Reliable Low-cost Grid Power with 100% Wind, Water, and Solar," *Proceedings of the National Academy of Sciences*, June 27, 2015, <http://www.pnas.org/content/114/26/6722.full.pdf>.

<sup>33</sup> Eduardo Porter, "Fisticuffs over the Route to a Clean-Energy Future," *The New York Times*, June 20, 2017, <https://www.nytimes.com/2017/06/20/business/energy-environment/renewable-energy-national-academy-matt-jacobson.html>.

<sup>34</sup> *Ibid.*

- In 2012 the United States had a total of 390 million acres of cropland. More than three-quarters of that cropland was devoted to growing crops other than corn.<sup>35</sup>

Without dramatically increasing the number of acres of land devoted to growing corn for ethanol, there is no way to grow all transportation fuels. There is no mention of this fact in *From the Ashes*.

Environmentalists often argue that replacing fossil fuels with renewable sources will create more jobs in the latter industries than are lost in the former. However, a 2009 study of the employment effects of subsidies to renewable energy sources showed for every four jobs created by renewable energy, nine jobs in other sectors of the economy were lost.<sup>36</sup> The study's research director, Gabriel Calzada Alvarez,<sup>37</sup> did not object to the use of renewable energy sources like wind power on that basis. But he did find that when a government artificially props up renewables with subsidies, higher electricity costs (31 percent), tax hikes (5 percent), and government debt follow. In other words, renewables mean fewer jobs *and* higher costs.

U.S. Department of Energy reports on employment<sup>38</sup> and electricity generation<sup>39</sup> for all energy sources for 2016 make clear just how uneconomical renewables really are, as shown in Table 1. Each worker in the coal sector produces an astonishing 80 times more energy value than does a solar sector worker.

<b>Table 1</b> <b>Economics of Electricity Generation</b>			
<b>Industry</b>	<b>Employment</b>	<b>kWh of energy produced per employee</b>	<b>Value of electricity produced per employee*</b>
Solar	373,807	98,000	\$3,900
Natural gas	362,118	3,812,000	\$152,000
Coal	160,119	7,745,000	\$310,000
* Based on a value of 4 cents per kilowatt-hour			

<sup>35</sup> "Farms and Farmland Numbers, Acreage, Ownership, and Use," *2012 Census of Agriculture Highlights*, U.S. Department of Agriculture, National Agricultural Statistics Service, September 2014, [https://agcensus.usda.gov/Publications/2012/Online\\_Resources/Highlights/Farms\\_and\\_Farmland/Highlights\\_Farms\\_and\\_Farmland.pdf](https://agcensus.usda.gov/Publications/2012/Online_Resources/Highlights/Farms_and_Farmland/Highlights_Farms_and_Farmland.pdf).

<sup>36</sup> Gabriel Calzada Álvarez, *et al.*, "Study of the Effects on Employment of Public Aid to Renewable Energy Sources," Universidad Rey Juan Carlos, March 2009, <http://instituteeforenergyresearch.org/wp-content/uploads/2015/05/090327-employment-public-aid-renewable.pdf>.

<sup>37</sup> "The Big Wind-power Cover-up," *National Wind Watch* (website), March 12, 2010, <https://www.wind-watch.org/news/2010/03/12/the-big-wind-power-cover-up/>.

<sup>38</sup> "U.S. Energy Employment Report: 2017," U.S. Department of Energy, Table 1, p. 29, [https://energy.gov/sites/prod/files/2017/01/f34/2017%20US%20Energy%20and%20Jobs%20Report\\_0.pdf](https://energy.gov/sites/prod/files/2017/01/f34/2017%20US%20Energy%20and%20Jobs%20Report_0.pdf).

<sup>39</sup> "Electricity Power Monthly: June 2017," Table 1.1, Independent Statistics and Analysis, U.S. Energy Information Administration, August 24, 2017, [https://www.eia.gov/electricity/monthly/epm\\_table\\_grapher.php?t=epmt\\_1\\_01](https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_1_01).

While many people believe “creating more jobs” ought to be the goal of every public policy, the objective in fact should be producing the most value with as little work as necessary. If renewables could produce as much or more energy with *fewer* rather than more workers, it would be better for everyone because that would mean renewable energy sources are more efficient. By requiring more workers to produce the same (or less) power, renewables demonstrate they are much less desirable than fossil fuels.

*From the Ashes* completely misses the economic and labor implications of its claims about a renewable energy economy. This makes it misleading and incomplete.

## 7. Renewables are not so clean

A recurring theme in *From the Ashes* is that coal is dirty and dangerous, while renewables are clean and safe. The program treats us to John Mellencamp singing the 1946 song by singer-songwriter Merle Travis titled “Dark as a Dungeon,” a lament about the danger and drudgery of working in an Appalachian coal mine.<sup>40</sup> This has been a rallying song among miners seeking improved working conditions. As the song is playing, *From the Ashes* shows 1940s working conditions in the mines.

The annual chance of a miner being killed was almost one in 500 in the 1940s. Today it is one in 10,000 – the same as the chance of being killed in an auto accident.

In 1946, U.S. firms employed 463,079 coal miners, and 968 were killed in accidents.<sup>41</sup> In 2016, there were only eight fatalities among the 81,485 miners employed. The annual chance of a miner being killed was almost one in 500 in the 1940s. Today it is one in 10,000 – the same as the chance of being killed in an

auto accident. Coal production was 480 million tons in 1949 and 728 million tons in 2016.<sup>42</sup> Today’s miners produce ten times the amount of coal per worker as they did 70 years ago. None of these facts was reported in *From the Ashes*. Instead, viewers are treated to “Dark as a Dungeon” and gritty black-and-white b-roll, once again meant to mislead rather than reflect twenty-first century coal mining realities.

In touting renewables as clean, *From the Ashes* also ignores facts to the contrary. Solar and wind energy systems contain toxic materials such as silicon, cadmium, lead, chromium, and rare earth metals. Environmental problems exist in extracting these minerals and disposing of their wastes, and those activities also use energy. Taking these into account, a 2013 analysis, “Solar Energy:

---

<sup>40</sup> John Mellencamp, “Dark as a Dungeon,” <https://www.youtube.com/watch?v=NaBgIElgQ5w>.

<sup>41</sup> “Coal Fatalities for 1900 Through 2016,” Mine Safety and Health Administration, U.S. Department of Labor, <https://arlweb.msha.gov/stats/centurystats/coalstats.asp>.

<sup>42</sup> “Annual Energy Review, Table 7.2,” U.S. Energy Information Agency, September 27, 2012, <https://www.eia.gov/totalenergy/data/annual/showtext.php?t=ptb0702>.

Net Energy Yields and Toxic Waste Problems,” showed it took eight years of operation before a solar plant in the Atlanta, Georgia area had a net energy yield.<sup>43</sup>

California records<sup>44</sup> show 17 solar companies, which had 44 manufacturing facilities in California, produced 46.5 million pounds of sludge and contaminated water from 2007 through the first half of 2011, contamination not considered in *From the Ashes*. Why is this pollution ignored or hidden, and viewers encouraged to compare seemingly pristine renewable energies to 1940s coal mines? How could this heavy-handed misrepresentation of the facts gotten by the science writers and editors at National Geographic?

A new study by Environmental Progress warns toxic waste from used solar panels poses a global environmental threat.<sup>45</sup> The Berkeley-based group found solar panels create 300 times more toxic waste per unit of energy than do nuclear power plants. The energy density of nuclear power is huge in comparison to solar panels.

The United States has 1.4 million solar energy installations, many of which are nearing the end of their 25-year operating lifetime.<sup>46</sup> Soon there will be a flood of unusable solar facilities that may be abandoned or taken down to reclaim useful materials and dispose of waste. The volume and mass of waste will be large and may be comparable to coal ash waste so prominently featured in *From the Ashes*.

How could this heavy-handed misrepresentation of the facts gotten by the science writers and editors at National Geographic?

In 2016, solar and wind produced only 0.9 percent and 5.6 percent of U.S. electricity, respectively.<sup>47</sup> This compares to coal’s production of 30.4 percent and rising for 2017. On the basis of energy value produced, waste from renewables is huge compared to coal. Why didn’t the producers of *From the Ashes* do the math and show viewers just how polluted the country would be if renewables replace coal?

---

<sup>43</sup> Jim Rust, “Solar Energy: Net Energy Yields and Toxic Waste Problems,” *Freedom Pub* (blog), The Heartland Institute, March 3, 2013, <http://blog.heartland.org/2013/03/solar-energy-net-energy-yields-and-toxic-waste-problems/#more-13707>.

<sup>44</sup> “Solar Panel Makers Grapple With Hazardous Waste Problem,” *Financial Report*, February 11, 2013, <http://business.financialpost.com/commodities/energy/solar-panel-makers-grapple-with-hazardous-waste-problem>.

<sup>45</sup> Jemin Desai and Mark Nelson, “Are We Headed for a Solar Waste Crisis?” *Environmental Progress News* (website), June 21, 2017, <http://www.environmentalprogress.org/big-news/2017/6/21/are-we-headed-for-a-solar-waste-crisis>.

<sup>46</sup> Julie Kelly, “A Clean Energy’s Dirty Little Secret,” *National Review* (website), June 28, 2017, <http://www.nationalreview.com/article/449026/solar-panel-waste-environmental-threat-clean-energy>.

<sup>47</sup> “What Is U.S. Electricity Generation by Energy Source?” U.S. Energy Information Agency, <https://www.eia.gov/tools/faqs/faq.php?id=427&t=3>.

## Conclusions

On its website, National Geographic says “we believe in the power of science, exploration and storytelling to change the world.” It says it is “a global nonprofit organization committed to exploring and protecting our planet.” *From the Ashes* falls short of advancing this mission.

Instead of raising its voice to educate and inform the public about an important public policy controversy, National Geographic chose to produce a propaganda film.

With *From the Ashes*, National Geographic deviated from the path of producing interesting and science-based documentaries, and instead joined the ranks of advocates, special-interest groups, and alarmists offering a distorted and inaccurate vision of the role of fossil

fuels in human civilization. Instead of raising its voice to educate and inform the public about an important public policy controversy, National Geographic chose to produce a propaganda film painting fossil fuels as a destroyer of lives and health. It ignored and hid all facts that run contrary to its narrative. It chose storytelling over truth-telling.

Popular culture shapes attitudes and public policy, even when the themes and stories it promotes contradict scientific and economic reality. For example, former vice president Al Gore’s film *An Inconvenient Truth* was so riddled with errors and exaggeration, a British court ordered it not be shown to schoolchildren unless accompanied by a guide pointing out places where it presented “propaganda” and not informed scientific opinion.<sup>48</sup> Gore never amended his film or corrected the mistakes in public comments. Worse, he simply repeats many of the mistakes and false predictions in his new film, *An Inconvenient Sequel*, which is even more shrill and unscientific than the first.

*From the Ashes* could have undone some of the damage caused by Gore’s movies and other recent movies that mislead rather than inform viewers. It is a shame that its producers had a different agenda.

# # #

---

<sup>48</sup> Sally Peck, “Al Gore’s ‘Nine Inconvenient Untruths,’” *Telegraph*, October 11, 2007, <http://www.telegraph.co.uk/news/earth/earthnews/3310137/Al-Gores-nine-Inconvenient-Untruths.html>.



## About the Authors

**James H. Rust**, now retired, was professor of nuclear engineering at the Georgia Institute of Technology. He is the author of *Nuclear Power Plant Engineering* (Atlanta, GA: Haralson Publishing Company, 1979). He funds several scholarships for students majoring in chemical engineering at Purdue University. Rust is a policy advisor for The Heartland Institute and an outspoken critic of unnecessary alarmism over man-made global warming. He currently is delivering a talk titled “America’s Failed Energy Policies and the Reason Why.”

**Edward Hudgins** is research director for The Heartland Institute. Before joining Heartland he worked in similar capacities for The Atlas Society, Cato Institute, and The Heritage Foundation. Among other publications, he is the author or coauthor of *The Republican Party’s Civil War: Will Freedom Win?* (The Atlas Society, 2014), *Space: The Free-Market Frontier* (Cato Institute, 2002), and *Freedom to Trade: Refuting the New Protectionism* (Cato Institute, 1997). In addition to his think-tank work, Hudgins was a senior economist at the Joint Economic Committee of the U.S. Congress, specializing in trade and regulatory issues.

## About The Heartland Institute

The Heartland Institute is a national nonprofit research and education organization. Founded in Chicago, Illinois in 1984, Heartland’s mission is to discover, develop, and promote free-market solutions to social and economic problems. Its activities are tax-exempt under Section 501(c)(3) of the Internal Revenue Code.

Heartland is headquartered in Arlington Heights, Illinois and has a full-time staff of 39 and an annual budget of \$6 million. It is supported by the voluntary contributions of approximately 5,300 supporters. For more information, please visit our website at [www.heartland.org](http://www.heartland.org), call 312/377-4000, or write to The Heartland Institute, 3939 North Wilke Road, Arlington Heights, IL, 60004.