

## Summary of Energy Transition Concerns

# Harmful “Clean Energy” Solutions: What You Need To Know

Several climate policy “solutions” can actually do more harm than good. That’s right, some energy resources classified as “renewable” and “clean” by governments are increasing harmful air and climate pollution and delaying our transition to clean, just, and equitable energy. They include:

- **Carbon Capture & Storage (CCS)**  
A largely unproven method to capture and store greenhouse gases (GHGs) from fossil plants
- **Hydrogen Gas**  
Producing hydrogen gas from various energy-intensive processes<sup>1</sup> to burn for energy
- **Biogas**  
Burning gas produced from organic materials or waste, such as from dairy digesters, manure, and landfills, for energy
- **Biomass**  
Burning wood to produce energy
- **Municipal Waste Incineration**  
Burning trash to generate heat and produce energy

## Why These “Solutions” Do More Harm Than Good

- 1 **Their facilities are often sited near communities of color and low-income communities, harming these populations the most.<sup>2</sup>**
  - **Carbon capture and storage** can worsen health-damaging air pollution because 10- to 40-percent more fossil fuel is required to power CCS equipment. Plus, the dangers of transporting and storing carbon cannot be overstated: carbon dioxide pipelines have significant risks of ruptures or leaks that can injure nearby residents.<sup>3</sup>
  - Communities near **waste incinerators** experience higher rates of cancer and reproductive disorders.<sup>4</sup> A 2019 study shows that 1.6 million Americans, most of them people of color and low income, live near the 12 most polluting incinerators in the United States.
  - Current and proposed **hydrogen** facilities made from fossil fuels with CCS, nuclear energy, biomethane, and/or biomass would maintain—or even worsen—health-damaging air and water pollution in frontline communities. And burning hydrogen for energy emits harmful air pollution.<sup>5</sup>
  - Woody **biomass** is often processed into wood pellets or biodiesel. These production processes release significant amounts of air and water pollution, produce alarming levels of noise throughout the night, and pose many other risks, including dangerous fires and explosions.<sup>6</sup>
- 2 **They do not help address climate change; in fact, they can make it worse.**
  - **Biogas** production poses a severe health risk to nearby communities. The components of biogas contain trace amounts of compounds that can be toxic to human health, including known carcinogens like benzene. Concentrated animal feeding operations (CAFOs) are particularly concerning because they produce noxious odors that trap people in their homes.<sup>7</sup>
  - **CCS** projects have repeatedly failed to deliver on promised climate targets.<sup>8</sup> A recent study shows that CCS at a coal plant only captured around 10 percent of its carbon emissions over a 20-year period.<sup>9</sup>
  - **Hydrogen** made from fossil fuels and relying on CCS (aka “blue hydrogen”) will require more upstream gas production to power the CCS equipment, resulting in more GHG emissions. Hydrogen made from renewable sources (aka “green hydrogen”) could be used for hard-to-electrify sectors, but otherwise, electricity directly from renewable sources is more cost effective, more energy efficient, and safer. Hydrogen use is also highly susceptible to leakages, which contribute to climate change if not adequately addressed.<sup>10</sup>
  - **Waste incinerators** emit more carbon than coal to produce the same amount of energy.<sup>11</sup>

- **Biomass** production and use often generates more greenhouse gas emissions than the fossil fuels they are intended to replace.<sup>12</sup> Carbon is released by logging, processing the logs into pellets, and then transporting them. Plus, logging trees for electricity destroys valuable carbon sinks.
  - **Biogas** combustion generates carbon dioxide and risks methane leakage, just like fossil gas combustion, because most biogas is methane.<sup>13</sup>
- 3 They are very expensive and prolong our reliance on outdated, damaging energy sources.**
- Adding **CCS** technologies to a power plant can more than double the construction costs and increase the cost of energy produced by up to 61 percent.<sup>14</sup> Despite failed projects, missed targets, and documented risks, the CCS industry remains afloat due to billions of dollars in federal incentives each year.<sup>15</sup>
  - Using **biomass** to fuel electricity production or transportation is more expensive than other less-polluting alternatives, including solar, geothermal, and wind energy.<sup>16</sup> In Europe and the United States, renewable mandates that include biomass direct billions of dollars in subsidies to the industry each year. Without these massive subsidies, the biomass industry could simply not compete with wind and solar.<sup>17</sup>
  - **Biogas** costs more to produce than fossil gas. One study found that it can cost up to five times as much!<sup>18</sup>
  - Current infrastructure cannot be used to produce **hydrogen**—let alone transport or store it—without expensive major upgrades and continued safety concerns. Producing and using green hydrogen is less efficient and more costly than directly using renewable energy and other types of energy storage.<sup>19</sup>

### This fact sheet is based on the Equity Fund's Energy Transition Concerns series. Learn more:

- Carbon Capture and Storage: A Dangerous Distraction (2022) – [Policy Brief](#) | [Blog](#)
- Hydrogen Gas: A False Promise (2022) – [Policy Brief](#) | [Blog Part 1](#) and [Part 2](#)
- Biogas: A Polluting Source, Greenwashed (2022) – [Policy Brief](#) | [Blog](#)
- Biomass: The Heavy Toll of Burning Trees for Energy (2022) – [Policy Brief](#) | [Blog](#)
- Waste Incineration: Deeply Harmful and Outdated (2022) – [Policy Brief](#) | [Blog](#)

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### Endnotes

1. For a description of the main methods used to produce hydrogen, see **Table 1** in the Equity Fund's policy brief *Hydrogen Gas: A False Promise*.
2. See, e.g., <https://ilsr.org/wp-content/uploads/2018/12/ILSRIncinerationFinalDraft-6.pdf>; <https://waterkeeper.org/news/update-exposing-fields-of-filth/>; <https://www.dogwoodalliance.org/2020/06/the-injustice-of-bioenergy-production/>.
3. [http://precaution.org/lib/ccs\\_energy\\_penalty\\_for\\_coal\\_vs\\_natural\\_gas.2016.pdf](http://precaution.org/lib/ccs_energy_penalty_for_coal_vs_natural_gas.2016.pdf); [https://www.pnnl.gov/main/publications/external/technical\\_reports/PNNL-20933.pdf](https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-20933.pdf); <https://pstrust.org/wp-content/uploads/2022/03/CO2-Pipeline-Backgrounder-Final.pdf>
4. For examples of studies demonstrating links between incinerators and cancer and reproductive disorders, see Peter W. Tait et al., (Sept. 18, 2019), *The health impacts of waste incineration: A systematic review*. *Australian and New Zealand Journal of Public Health* 44, 1, pp. 40-48; <https://onlinelibrary.wiley.com/doi/full/10.1111/1753-6405.12939#:~:text=Results%3A%20A%20range%20of%20adverse,incinerator%20technologies%20may%20reduce%20exposure>.
5. <https://www.intechopen.com/chapters/40411>; [https://earthjustice.org/sites/default/files/files/hydrogen\\_earthjustice\\_2021.pdf](https://earthjustice.org/sites/default/files/files/hydrogen_earthjustice_2021.pdf)
6. <https://www.environmentalintegrity.org/wp-content/uploads/2017/02/Biomass-Report.pdf>
7. [https://www.researchgate.net/publication/335598392\\_Composition\\_and\\_Toxicity\\_of\\_Biogas\\_Produced\\_from\\_Different\\_Feedstocks\\_in\\_California](https://www.researchgate.net/publication/335598392_Composition_and_Toxicity_of_Biogas_Produced_from_Different_Feedstocks_in_California)
8. See **Box 5** in the Equity Fund's policy brief *Carbon Capture and Storage: A Dangerous Distraction*.
9. <https://web.stanford.edu/group/efmh/jacobson/Articles/Others/19-CCS-DAC.pdf>
10. [https://static1.squarespace.com/static/5fb58e0bd182a42ba80eabdd/t/62ed51f3fe9eba2d0507795b/1665523209054/CCEEF\\_Hydrogen+Gas+Policy+Brief\\_April+2022.pdf](https://static1.squarespace.com/static/5fb58e0bd182a42ba80eabdd/t/62ed51f3fe9eba2d0507795b/1665523209054/CCEEF_Hydrogen+Gas+Policy+Brief_April+2022.pdf); <https://www.edf.org/blog/2022/03/07/hydrogen-climate-solution-leaks-must-be-tackled>
11. <http://www.energyjustice.net/incineration/climate>
12. Mary S. Booth, *Trees, Trash, and Toxics: How Biomass Energy Has Become the New Coal*, p. 5, <https://www.pfpi.net/trees-trash-and-toxics-how-biomass-energy-has-become-the-new-coal/>
13. <https://doi.org/10.1080/10934529.2018.1459076>; <https://www.eia.gov/energyexplained/biomass/landfill-gas-and-biogas.php>
14. <https://www.ciel.org/wp-content/uploads/2021/07/Confronting-the-Myth-of-Carbon-Free-Fossil-Fuels.pdf> (citing <https://pubs.acs.org/doi/10.1021/acs.est.9b06147>)
15. See **Box 1** in the Equity Fund's policy brief: *Carbon Capture and Storage: A Dangerous Distraction*; <https://cen.acs.org/environment/greenhouse-gases/45Q-tax-credit-s-luring/98/i8>.
16. [https://www.eia.gov/outlooks/aeo/pdf/electricity\\_generation.pdf](https://www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf)
17. <https://www.nrdc.org/sites/default/files/dominion-investments-biomass-electricity-ib.pdf>
18. <https://www.sightline.org/2021/03/09/the-four-fatal-flaws-of-renewable-natural-gas/> (citing a 2019 study for the American Gas Foundation)
19. <https://phys.org/news/2006-12-hydrogen-economy-doesnt.html>; <https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/hydrogen-technology-faces-efficiency-disadvantage-in-power-storage-race-65162028>