

**The Effect of *Chernobyl* (2019) on the Perception, Development, and Current
Implementation of Nuclear Energy in the United States**

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On my honor as a University Student, I have neither given nor received unauthorized aid on this
assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction

In 2014, the Intergovernmental Panel on Climate Change (IPCC) released their Fifth Assessment Report (AR5), an in-depth analysis on the effect of greenhouse gases (GHG) on global climate and the consequences it posed on society. Many of the conclusions found in the report were severely alarming. Observed increases in atmospheric greenhouse gas concentrations were discovered to raise the “likelihood of severe, pervasive, and irreversible impacts,” seen in the form of rising sea levels, dangerous weather, longer droughts, decreased food production, and much more (IPCC Working Group II, 2014, p. 14). Not only was it extremely likely that human influence was the leading cause of these increases, but current energy practices were completely incompatible with the end-of-century target goal of reducing global temperatures by 1.5 to 2 degrees Celsius (IPCC Working Group I, 2014). What’s even more concerning is that the IPCC’s Sixth Assessment Report (AR6), whose studies have been released in the past year, doubles down on AR5’s conclusions with some calling it “the starkest warning yet” (Harvey, 2021). If we’re going to meet the target goal set by IPCC, reduce net GHG emissions, and continue to satisfy our ever-growing energy needs, transitioning to non-fossil fuel energy sources is a necessary change (United Nations, 2021).

One such alternate energy technology proposed to replace fossil fuels is nuclear energy, which fissions radioactive elements, most commonly uranium-238, to generate heat for steam production. This steam is then used by a turbine to generate electricity for the grid. Appeal for nuclear energy came from the fact that CO₂, the GHG most responsible for global warming, is not emitted during the process (U.S. Environmental Protection Agency, 2020). The fuel is also recyclable, which has many economic advantages (Rapier, 2022). However, radioactive waste is produced during the fission process requiring adequate storage, and potential disasters could be

absolutely devastating. No accident better encapsulates this consequence more than the nuclear disaster in Chernobyl. On April 26, 1986, near the city of Pripjat, Ukraine, the 4th reactor of Chernobyl Nuclear Power Plant experienced a meltdown which caused explosions and fires that released radioactive contaminants. While the true death toll is highly disputed and likely to remain unknown, it is possible that thousands perished as a result of radiation exposure and cancer (Gray, 2019). The exclusion zone of Chernobyl, set because of the radioactive contaminants, won't be habitable again for another 20,000 years (Tedesco, 2022).

On May 6th, 2019, the first episode of *Chernobyl* was released on HBO. Brainchild of writer and showrunner Craig Mazin, who first started researching the project in 2014, the historical drama miniseries told the horrific story of Chernobyl and the cleanup efforts that soon followed. The show was greenlit on July 26th, 2017, with casting and filming occurring the following year (Stanhope, 2017). While the series was extensively researched, liberties were taken with some scenes for increased dramatization (Longridge, 2019). *Chernobyl* was a huge success, both critically and commercially, with Google ranking it the fourth most popular show of 2019 (Venable, 2019). Over its month-long run the show gathered a cumulative audience of 8 million viewers, with millions more watching the show or key scenes on streaming services and YouTube since its release (Clark, 2019). While it has become more difficult to find concrete media viewership data, it's crucial to note that the cultural impact of a well-received and popular television show goes way beyond the number of people who initially watch it (Jones, 2022; Huston, 1992). One example that this paper will discuss in addition to *Chernobyl* is *The China Syndrome* (1979), a movie whose impact affected far more people than the estimated 19-22 million people who watched the movie in theaters (IMDb, n.d.; Suneson, 2019).

Contrary to past media on nuclear power risks, *Chernobyl* is having a more ambivalent impact on the perception, development, and implementation of US nuclear energy. A review of literature shows that nuclear energy perceptions don't usually match their accident occurrence rates, and media can affect how people view technology, especially nuclear energy. Data gathered for investigating and supporting this paper's claim include national polls, various datasets, critic and audience reviews, and academic papers looking at the sociotechnical impacts of the show. In my review of this evidence, I will examine the social, political, and economic impacts of *Chernobyl* on America's nuclear industry, with a particular emphasis on the alteration or lack thereof of the country's sociotechnical imaginaries, as defined by Sheila Jasanoff and Sang-Hyun Kim, regarding future energy production. Doing this points to *Chernobyl* having a negative effect on the US nuclear industry purely in a correlational sense, not directly, and that this evidence isn't particularly strong. Further, there are many critic and audience reviews stressing the show's key message that it wasn't primarily the technology that caused Chernobyl, but the inadequately trained personnel and Soviet Union's administrative culture of secrecy and lies. Understanding this message, broadly speaking, points to an American sociotechnical imaginary where nuclear energy will be utilized in some degree to address our energy needs amidst the climate crisis.

Literature Review

Like many proposed solutions to undesired phenomena, various alternative sources and technologies suggested to replace fossil fuels and their associated GHG emissions rarely have a unified opinion on them. Some critics view these measures as simply impractical, while others are opposed for economic and political reasonings, or comfort for the status quo (Gross, 2022).

One that continues to split individuals and groups alike, especially in the polarized United States, is nuclear energy (Leppert, 2022).

The consequences of a worst-case scenario nuclear disaster are particularly devastating due to the long-lasting effects of radiation, and this can weigh heavily in peoples’ minds despite the fact that oil and natural gas accidents are far more likely to occur than nuclear ones. This is best seen in a report sponsored by the Nuclear Energy Agency, where from 1969-2000 it was discovered that “the statistical basis for individual energy chains differs radically. For example, there are 1,221 severe accidents with at least five fatalities in the coal chain and only one in the nuclear chain (Chernobyl),” (Gordelier & Cameron, 2010, p. 34). A summary of their findings can be found in Table I.

Table I: Summary of Severe (≥ 5 fatalities) Accidents that Occurred in Fossil, Hydro, and Nuclear Energy Chains in the Period 1969-2000

Energy chain	OECD			Non-OECD		
	Accidents	Fatalities	Fatalities/ GWey	Accidents	Fatalities	Fatalities/ GWey
Coal	75	2 259	0.157	1 044	18 017	0.597
Coal (data for China 1994-1999)				819	11 334	6.169
Coal (without China)				102	4831	0.597
Oil	165	3 713	0.132	232	16 505	0.897
Natural Gas	90	1 043	0.085	45	1 000	0.111
LPG	59	1 905	1.957	46	2 016	14.896
Hydro	1	14	0.003	10	29 924	10.285
Nuclear	0	0	–	1	31*	0.048
Total	390	8 934		1 480	72 324	

Note: * These are immediate fatalities only.

Source: Data provided to NEA by PSI.

The use of media depicting or discussing a particular technology can affect peoples’ perception of that technology, including misrepresentations and second-hand descriptions. One fun example of this phenomena is the effect movies like *Blade Runner* (1982) and *Terminator* (1984) had on the opinion of robots and those trying to build them. Both movies were cautionary

tales of the havoc that unrestricted innovation involving robots and AI could inflict on humanity, and many viewers backed increased oversight on this field after watching each movie (Savela et al., 2021). However, one does not need to actually view the media to have their views affected by it. Critic reviews can have a significant impact on individuals' opinions regarding a show or aspects of it, even if they haven't seen it (Greally, 2021).

Looking at the nuclear industry specifically, past media depicting the energy source in a negative light such as *The China Syndrome* (1979) have impacted Americans' view of nuclear energy. Not only did the film frighten Americans on how easily a nuclear meltdown could theoretically occur at any time, but it also exposed what the filmmakers saw as a corrupt energy-media complex that encouraged nuclear energy without factoring in the risks (Shaw, 2013). Add in the fact that just thinking about the consequences of a nuclear disaster engages our behavioral immune system, and suddenly one can realize how impactful this film was on Americans (Hacquin et al., 2022). While the true magnitude of the effect this film had on the US nuclear industry can never truly be known, this excerpt from an editorial by New Zealand writer and filmmaker Andrew Todd (2019), comes close:

It's fascinating to think what public opinion on nuclear power would look like had *The China Syndrome* not shone a spotlight on it. Would Three Mile Island have had the same significance in the public eye? Would the subsequent string of anti-nuclear films have been made? Would nuclear power have expanded more than it did, and would that have resulted in more accidents? Pop culture has a profound effect on public sentiment - just ask Soviet propagandists. The history of the past century, in a sense, is the history of pop culture, and vice versa. What will the next *China Syndrome* be?

In this research paper, part of answering the research question is seeing if *Chernobyl* has become the next *China Syndrome* for Americans.

Sheila Jasanoff and Sang-Hyun Kim's sociotechnical imaginaries is the STS framework through which the evidence will be viewed and analyzed. Sociotechnical imaginaries are defined as "collectively imagined forms of social life and social order reflected in the design and fulfillment of nation-specific and/or technological projects" (Jasanoff & Kim, 2009, p. 120). Here imaginaries are not policy agendas or master narratives, but instrumental and futuristic. They are less explicit and politically accountable than policy agendas, and they don't exist just to advocate investment like master narratives. Summarized by Jasanoff and Kim (2009):

They project visions of what is good, desirable, and worth attaining for a political community; they articulate feasible futures. Conversely, imaginaries also warn against risks or hazards that might accompany innovation if it is pushed too hard or too fast. In activating collective consciousness, imaginaries help create the political will or public resolve to attain them. (p. 123)

So overall this framework is useful for explaining social opinions on technology and depictions of that technology, as well as the impact those have on shaping policy decisions.

Now there are two key concepts that really provide a basis for Sociotechnical Imaginaries. One is that the capacity to imagine futures is critical to social and political life. Part of the reason why people protest and petition is because they can think of a future where the thing they're supporting flourishes and leads to better overall outcomes for them and potentially others. The same could be said for things they're against. From a social perspective, many of the actions we do today are to secure connections that we imagine are important for our futures. A major example of this is networking, and how important it can be for our professional lives.

Another key concept that builds off this first point is that how we organize and practice science and technology is based on our future considerations and goals. We see this all around us, from the development of smartphones to improved car safety to more accessibility options. Nuclear energy is no different.

Research Question and Methods

The research question at the heart of this paper is how did *Chernobyl* (2019) affect the perception, development, and current implementation of nuclear energy in the United States? To investigate this topic, I will use a combination of primary and secondary sources, including national polls on nuclear energy, datasets regarding nuclear development after the show's release, critic and audience reviews, and academic papers discussing the specific sociotechnical impact of *Chernobyl*. While this research will focus solely on the United States, I may use other countries for small comparisons. In my review of this evidence, I will examine the social and economic impacts of *Chernobyl* on America's nuclear industry, with a particular emphasis on the alteration or lack thereof of the country's sociotechnical imaginaries or dreams regarding future energy production. This will not include an in-depth analysis of policy enactments, but rather a holistic review of US nuclear energy perceptions which affects its development and current implementation.

Analysis

Critic and audience reviews that discuss key themes of the show are rather balanced, acknowledging that there's more to this disaster than just a faulty reactor. There's also a push to portray these events in a way that many can understand and easily digest, even if some of the scenes are hard to watch. Ani Bundel of NBC News (2019) wrote that, "Clearly, there is a lesson here about those who rise to power because they know which boots to lick. But the series also

serves as a broader indictment of the culture of secrecy that surrounds so much of governmental work. When lies are the currency of promotion, lies become the way of life.” Brian Tallerico of Roger Ebert Reviews (2019) explained that:

If you think that sounds blindingly depressing, you’re not wrong, but there’s an artful power to [Director Johan] Renck and writer Craig Mazin’s approach that keeps *Chernobyl* from becoming a dirge. They add a human element to something that those of us old enough to remember watching news stories on TV have always kind of understood from a distance. Sure, we intellectually knew there were human stories involved, but *Chernobyl* takes very academic, scientific material and makes it understandable and tactile.

Lastly, to look at an audience review, an excerpt from Mato S. (2023) who commented on Rotten Tomatoes drives the points home: “...The themes of sacrifice, human error, and the cost of political ambition are explored with great depth and nuance, making the series both a cautionary tale and a tribute to the courage and resilience of the human spirit...”

Now it should be noted that some reviews really criticize some of the show’s historical inaccuracies or think of it as being an American propaganda piece:

While HBO’s *Chernobyl* has been a hit with both Americans and Russians - the programme is not so popular with the Kremlin. Russian officials say *Chernobyl* is a propaganda hit piece. And a pro-government television network is producing its own show, which partly blames the disaster on the CIA. (Medvedenko & Eremeeva, 2019)

However, any media that portrays a country in a negative light is likely to be criticized by the government of that country, *especially* when those countries are the United States and Russia. Also, while a faulty reactor design was a major reason for the disaster (it was a Soviet reactor

design), it's been proven that the Soviet Union bears much of the responsibility when it comes to the bad response to the disaster (Herbert, 1987).

Although there's some evidence pointing to *Chernobyl* having a negative impact on US nuclear energy, it's very correlational, not that strong, only applies to certain groups, or can be explained with other phenomena. The number of self-identifying Democrats and Republicans that somewhat or strongly oppose nuclear energy slightly increased in 2019 and subsequent years, but the number of independents who somewhat or strongly favor it shot up dramatically (Saad, 2022). Only one new US nuclear plant has been approved for construction since the show's airing, Plant Vogtle in Georgia, but this plant is the first one to be constructed in decades (Amy, 2022). If anything, this shows that, at least for Georgian residents and politicians, *Chernobyl* didn't influence them enough to not approve this plant. US nuclear energy capacity and generation has been decreasing since 2019 (US Energy Information Association, 2022). However, COVID-19 and the aging of pre-existing nuclear infrastructure could largely account for this decrease. And President Biden is pushing nuclear energy, at least in helping existing facilities (Penn, 2022).

Now, *Chernobyl* has been very useful for anti-nuclear groups who can now point to the horrific scenes the show contains as a reason why Americans shouldn't back nuclear: "[T]his meticulously researched dramatization brought home the true extent of the enduring devastation the accident caused to lives, health and the environment," said Linda Pentz Gunter, an international specialist with Beyond Nuclear. "It will be up to U.S. viewing audiences to see past issues such as 'Soviet' reactor designs and to understand that something like this could happen again anytime, anywhere, and to them and their families," (Towhey, 2019). Therefore, one could argue that *Chernobyl* did have a negative impact of US nuclear energy because it gave fuel to

these groups. However, this can be rebutted with two points. First is that Beyond Nuclear would've used this show to advance its own agenda regardless of the message *Chernobyl* was trying to present. The subject matter alone is enough for Beyond Nuclear to make its points, but a pro-nuclear group could use the film to show why lies are more critical than the technology, which they absolutely have done (Gunter, 2019). Second, and perhaps most crucially, while it is true that some people may have doubled down on support for or converted to Beyond Nuclear's cause, we see on a national level the effects have been rather small (Saad, 2022).

Based on the evidence, the key takeaways expressed in reviews of *Chernobyl* and the insignificant negative impacts of the show point to imaginaries where nuclear energy is a part of our energy portfolio post-fossil fuels. While a faulty reactor design was a part of the Chernobyl disaster, lies and the Soviet Union's oversight structure were the main culprits. So given better oversight, reactor design, and increased safety considerations, nuclear energy can theoretically flourish without the fear of another Chernobyl. This sentiment is exactly what showrunner Craig Mazin was going for when they made the show, which also shows a change in how nuclear energy is depicted in television (Adams, 2019). TV shows can actually provide benchmarks for how a specific society views a past situation, and this directly contributes to their development of imaginaries (Donstrup & Algaba, 2020). Therefore, one can conclude that audiences are generally more accepting of nuclear energy and the view that Chernobyl was an isolated incident, and that the show *Chernobyl* had a much more ambivalent impact on the US nuclear industry than many would have believed.

Conclusion

Chernobyl can be seen as an evolution of nuclear energy depiction in media, where it does not solely blame the technology, but the social and political factors surrounding that

technology. This research matters both for those who read and contemplate its findings, and for future researchers who attempt to build of this information. One such group of the former is people involved in media, who could read this and potentially alter how they portray man-made disasters in film and television shows. Another group is politicians could read this and see that while people may not want nuclear reactors directly in their backyard, there is support for them. In regards to future research, one could attempt to investigate direct impacts of the show on the US nuclear industry and perceptions, including long term effects (show is less than 4 years old). They also could look at other shows or movies that depict technology or technology-induced disasters in similar ways to Chernobyl, that is, an approach that doesn't just blame the technology but gives equal attention to pros and cons. An example would be *Promised Land* (2012) starring Matt Damon, a film discussing the ambivalence of fracking in small US towns (Focus Features, 2012). Though as we continue to fight climate change, the energy sources we choose to replace fossil fuels is going to be controversial. However, shows like *Chernobyl* can give us more balanced views on technology that before was almost always vilified, which can help us make more logical decisions on this front.

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