Lighting Up the Future: Nuclear Energy in Pennsylvania

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Some people see the reopening of Three Mile Island (TMI) like a roulette wheel, never knowing whether the result will be a success or a disaster. But nuclear accidents are not caused by random chance—and neither is progress. While many of my peers were focused on social media or video games, I spent hours watching YouTube videos about nuclear energy. I read news articles about energy production and watched the Netflix documentary *Meltdown: Three Mile Island* (Cooke, 2022). One moment that stayed with me was learning how a series of small, preventable human errors—not some flaw in nuclear science—caused the 1979 accident. That detail mattered to me. I was fascinated by the idea that splitting atoms could generate enormous amounts of energy. Years later, in chemistry class, I learned about radioactive decay and nuclear radiation, which deepened my understanding of the science I had been following for years. I began to see nuclear energy not as something to worry about, but as something worth understanding. I was both surprised and excited to hear that Three Mile Island might reopen. But I also found myself wondering, "How do you rebuild trust in a technology that so many people still fear?"

The partial meltdown at Three Mile Island in 1979 made an almost permanent mark on how Americans perceive nuclear power, especially in Pennsylvania. Although studies showed the environmental and health impacts were less severe than initially believed, the accident created fear and uncertainty that has never fully left (Nuclear Regulatory Commission, 2025). Accidents like Chernobyl in 1986 and Fukushima in 2011 only reinforced that fear. For many people, nuclear energy became associated with danger rather than innovation, and those memories still shape public opinion today. I talked to my math teacher, Mr. Lulewicz, who was attending college approximately one hour from the accident at the time. He recalled that Three

Mile Island “had many of us concerned and frightened” (L. Lulewicz, personal communication, March 2026). His response stood out to me because, even decades later, fear was still the first thing that came to mind. But the case for nuclear power has never been stronger. Energy demand in the United States continues to grow as new technologies require increasingly large amounts of electricity and other natural resources. Most of that energy still comes from fossil fuels that release carbon dioxide and accelerate climate change. Nuclear power plants generate large amounts of electricity without emitting carbon during operation, and unlike some renewable energy sources, they run regardless of weather conditions. A wind turbine produces nothing on a calm day; a solar panel produces nothing at night. On the other hand, nuclear power plants operate at over 90% capacity on average—higher than any other energy source—making them well-suited to serve as the reliable backbone of a clean energy grid (U.S. Energy Information Administration, 2024). Three Mile Island's Unit 1, before its closure in 2019, powered more than 800,000 average-sized homes (Constellation Energy, 2024). Its reopening is an opportunity to replace carbon-heavy energy with something cleaner and more reliable, with Pennsylvania leading that transition.

What many people overlook is that the 1979 accident actually made nuclear power safer. In the years that followed, the Nuclear Regulatory Commission reinforced its inspection and oversight processes, the industry established the Institute of Nuclear Power Operations to enforce higher safety standards, and reactor designs were improved to prevent the chain of errors that caused the TMI accident. Modern reactors are built with passive safety systems that shut down automatically without requiring human intervention, the very type of failure that contributed to the 1979 meltdown (Nuclear Regulatory Commission, 2024). After discussing these changes with my chemistry teacher, I was able to better appreciate how significantly the technology has

evolved since those early accidents. Nuclear medicine— including CT scans, nuclear imaging, and radiation therapy—is now one of the most trusted tools in modern healthcare. The same science that generates fear when associated with energy is saving lives in hospitals every day, proof that nuclear technology, with safeguards, can be both safe and transformative.

If Pennsylvania responds to this challenge successfully, the impact could be significant. The reopened plant is expected to generate enough electricity to power over a million homes while creating thousands of jobs in construction, operations, and supporting industries (Constellation Energy, 2024). The plant has also secured a long-term energy agreement with Microsoft to power its data centers (Constellation Energy, 2024). Reliable, carbon-free electricity would support economic growth and attract businesses that depend on stable power supplies. Communities near the plant could benefit from increased tax revenue, local investment, and long-term jobs that remain stable regardless of weather conditions. Most importantly, cleaner electricity would reduce pollution and support long-term climate goals. Success would mean that Pennsylvania will become a model for how the rest of the country can transition away from fossil fuels without sacrificing reliability.

Studying this issue has changed how I approach complex problems. When I was younger, I saw nuclear energy mainly as an impressive scientific achievement. As I learned more about Three Mile Island and discussed it with others, I realized that energy decisions involve trust, communication, and public understanding just as much as science—like the debates and arguments I have studied in other contexts. My interest has even pointed me toward potential careers in nuclear medicine, where the same principles that power cities can help diagnose and treat disease. Three Mile Island does not have to define the future of nuclear power. Instead, it can represent the turning point that led to stronger standards, better oversight, and a renewed

commitment to clean energy. The roulette wheel was never the right metaphor—because the outcome here depends not on luck, but on whether we are willing to learn from the past and apply that information. Pennsylvania has the opportunity to help lead that transition, and I want to be part of the generation that sees it through.

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