The Use of Nuclear Power

I. Introduction

A. Attention Getter: Power. Everyone needs power. You need power. I need power. We have several computers just in this room, plus the lights, etc. You and I all know that a lot of people on this planet need power. When millions or billions of people need something like power, the method by which we get it can have a pretty significant impact on our lives.

B. Specific Purpose Statement: One kind of power generation is nuclear power, and I hoping to let you know two reasons for and two reasons against using nuclear power.

C. Credibility Statement: I spent at least sixteen hours searching for and finding reliable, credible sources for this. I even reworked two of the four points after understanding the topic better.
On to my four main points. They are:

D. Preview of Main Points:

1. First, on the 'pro' side, that nuclear power is a power source that doesn't contribute to the problem of climate change in a significant way.
2. Secondly, it kills fewer people per energy generated than almost any other form of on-demand power
3. However, on the other hand there is the issue of waste products from nuclear reactors are quite harmful, and can even be deadly, and accidental exposure is a possibility.
4. And last, nuclear power plants are expensive.

E. **Transition:** Let me go back to my first point.

II. Body

A. Pro 1: Nuclear power is a source of power that doesn't contribute significantly to climate change. Now, I don't know what you've heard on the news about climate change, but whatever you've heard, you have to know that climate change is real.

1. Peer Testimony: Even back in 1912, an article partially entitled "Remarkable Weather of 1911: The Effect of Combustion of Coal on the Climate" by someone named Francis Molena in the March issue of "Popular Mechanics" (yes, it was around back then) hypothesized that the coal that we were burning was going to put enough CO2 into the atmosphere to warm the planet up, based off of a recent discovery that CO2 absorbs heat very well. We've seen that's true, since then. (Molena, Francis. "Remarkable Weather of 1911: The Effect of the Combustion of Coal on the Climate -- What Scientists Predict For The Future." Popular Mechanics, vol. 17, no. 3, Mar. 1912, pp. 339–42.)
2. Statistic: Fast forward to the modern era, 100 years after that Popular Mechanics article, and you have the collective mental might of thousands of the world's scientists all nailing down their best predictions in a group called the Intergovernmental Panel on Climate Change, or the IPCC. In a chapter entitled "Renewable Energy in the Context of Sustainable Development" in their "Special Report on Renewable Energy Sources and Climate Change Mitigation" from 2011 they have a chart showing that nuclear power's carbon output is near zero. Compare that to coal or

even ‘cleaner’ natural gas’, and you’ll see that the difference is quite stark (IPCC, 732)

B. Transition: Moving on to my second point, that...

C. Pro 2: Nuclear power is the least deadly form of power available.
   1. Expert Testimony: In an article published on the website “Our World In Data” in 2017 by (Dr?) Hannah Ritchie (I don’t know if she was a doctor when she wrote the article, but she’s a doctor now with Master’s degree in carbon management) entitled “It goes completely against what most believe, but out of all major energy sources, nuclear is the safest”, she states that when you factor in both accidents and air pollution, the death rate for nuclear power per terawatt generated is far below that of natural gas, oil, or coal, even when accounting for cancer. (It goes completely against what most believe, but out of all major energy sources, nuclear is the safest)
   2. Statistic: At the rate of deaths per terawatt generated she presents, we’ve killed over 2.6 million people for every one person who has died from nuclear power. (It goes completely against what most believe, but out of all major energy sources, nuclear is the safest)

D. Transition: Now that I’m done with the pros, time to discuss the cons. First up…

E. Con 1: Nuclear waste can still kill you, and you might not realize it’s happening until it’s too late.
   1. Narrative: So one of the byproducts of fission in a nuclear power plant is a substance called cesium 137. Even if it is a nuclear waste, it has applications in the medical field, such as for radiation therapy to fight cancer.
      One such medical device was in Goiânia, Brazil. According to “The Radiological Accident in Goiânia” published in 1988 by the International Atomic Energy Agency, the story goes something like this: In 1987 a small container about the size of a baby’s wooden toy block containing a salt of cesium 137 was stolen from a forgotten medical device and broken open by those who took it. The people who took it and others they showed it to were fascinated by the blue glow of the dust inside. A few even spread it over their skin, their floor, and a six year old girl later ate a sandwich while seated on that same floor.
      She, and three others died within a month. Over two hundred others had to be treated for radiation exposure. (The Radiological accident in Goiânia.)
   2. (Hypothetical?) Example: Nuclear waste. It can still kill you. And to give an example that ties it directly back to the use of nuclear reactors, a March 2018 article in the Japan Times entitled “Seven years on, radioactive water at Fukushima plant still flowing into ocean, study finds” talked about this same substance (Cesium-137) leaking into the ocean from one of the Fukushima reactors. (Seven years on, radioactive water at Fukushima plant still flowing into ocean, study finds)

F. Transition: And finally, for my last point...

G. Con 2: Nuclear power is really expensive. .
   1. Example: Just to give you an idea of how expensive nuclear power is, a CNN Business article from January of this year entitled “Hitachi shelves

$20 billion nuclear power plant in UK"... well, the title tells you what you need to know. They were building a power plant that was going to cost $20 billion. Apparently they had already spent more than $2 billion on it, before they stopped, and they stopped because they couldn't get additional funding from the government. There aren't many groups that can afford a price tag that large. Governments happen to be one of the few who can. (Hitachi shelves $20 billion nuclear power plant in UK)

H. Transition: That pretty much wraps up my four points.

III. Conclusion

A. Summary of main points
   1. First I showed that nuclear power is a power source that doesn't contribute to the problem of climate change in a significant way.
   2. Secondly, I talked about how it kills the least number of people globally than the other most common 'on-demand' power sources.
   3. I followed that up by pointing out the deadly nature of nuclear waste, even when it's used for other purposes, and pointed out that the same substance is leaking into the Pacific ocean right now
   4. And I finished by pointing out the high price tag on a new power plant.

B. Restate Purpose: hopefully fulfilling my purpose in sufficiently informing you of two pros and two cons of using nuclear power.

C. Remind Audience of Credibility: I'm pretty sure the number of cited sources should show how heavily I had to research this topic.

D. Decisive Concluding Statement: There are more reasons both for and against the use of nuclear power, but hopefully this helped highlight some of the big ones for you.

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