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Case (657)

Katherine and I negate.

Contention 1: Nuclear energy harms indigenous people

According to the Federal Trade Commission¹, it is estimated that 80% of all uranium is located on Native American tribal land. The “tribal sovereignty”² of Native Americans, which makes their lands exempt from state law and many environmental regulations, only increases their attractiveness as targets for facilities unwanted elsewhere.

Nuclear energy hurts Native Americans in 3 ways

1. Uranium mining

The government and the mining companies failed to inform the people of the Navajo Nation that working with uranium is hazardous to one’s health³. Uranium is both radioactive and has direct metal toxicity. According to Moore-Nall of Montana State University, 90% of all Navajo uranium miners died of lung cancer from inhaling toxic particles⁴.

2. Abandoned mines

All 2,885⁵ abandoned open pit uranium mines in Wyoming, Montana, and the Dakotas are on Sioux Nation land. Navajos still live near ⅓ of all abandoned uranium mines.⁶ According to NPR⁷, Native Americans are disproportionately without access to clean water infrastructure. Thus, they must rely on rivers and groundwater. This is really problematic as these sources of water have uranium levels at least 5x greater than safe drinking water standards⁸. Native Americans near abandoned mines were found with PCB levels, a highly toxic compound, 25,000⁹ times the standard for human health. The Department of Energy found that people living near uranium tailings piles are 200% more likely to have lung cancer.¹⁰

¹ Kline

² Public Citizen

³ Moore-Nall

⁴ Moore-Nall, 133

⁵ Kline (ibid.)

⁶ Alvarez

⁷ NPR - Morales

⁸ NPR - Morales

⁹ Hoover

¹⁰ Bruce E. Johnson, 2x

3. Radioactive spills

On July 16, 1979, over 1000 tons of solid radioactive mill waste spilled into the Puerco River and the Navajo nation. The amount of radiation that the Church Rock uranium spill released was much larger in magnitude than Three Mile Island¹¹. However, this accident received little to no public attention.

The government of New Mexico's cleanup effort was vastly inadequate. This is because the impoverished Navajo people were not able to advocate for themselves, thus the authorities did not communicate properly in order to warn the residents to protect themselves from the radiation and poisonous water. The IHS¹² urged Navajos not to drink the water nor enter it, however, the people did not have many alternatives. The radiation in the Puerco river showed 7,000 times the standard amount for drinking water.

Trump's recent \$1.5 billion proposal to revive uranium mining in the United States will force Native Americans to disproportionately bear the brunt of nuclear energy.

Contention 2: Nuclear Energy crowds out renewables

Currently, more than half of America's nuclear reactors are losing money. According to Spiegel¹³, nuclear power cannot be profitable without subsidies. Without the guaranteed feed-in tariffs, the plants would never pay off. New York, despite its aggressive renewable energy targets, will now spend more than twice as much on nuclear bailouts than on clean energy. This is really problematic because subsidies to nuclear energy crowds out renewables, which slows the transition to renewable energy.

Renewable energy is better in 3 ways:

1. More efficient

Jacobson of Stanford University found that renewable energy ramps up 100 times faster than nuclear energy to meet peaks in demands. Cooper of the Institute for Energy and Environment found that despite receiving \$600 billion in subsidies, nuclear energy only contributes to 5% of low carbon electricity. However, 95% of low carbon electricity has come from alternative energy.¹⁴

2. Produces less emissions

Jacobson found that renewable energy produces 23 times less emissions per unit electricity generated than nuclear energy.

¹¹ Moore-Nall

¹² Morris - Stanford

¹³ Der Spiegel

¹⁴ Cooper

3. Quicker to develop

Jacobson corroborates that the planning to operation time of nuclear power plants is 20 years, taking 17 years longer than renewable energy.

The impact is climate change:

The Brookings Institute found that emissions need to drop 60 percent in 12 years in order to mitigate the effects of climate change. If climate goals are not met, an additional 250,000¹⁵ people will die each year. Nuclear energy cannot decrease emissions quickly nor efficiently enough to save the planet from climate change.

For these reasons, we negate

¹⁵World Health Organization

Narrative

1. Trade off between nuclear and renewable energy subsidies
 - a. Pitted in direct competition with each other
2. Subsidies to renewables is much more preferable than subsidies towards nuclear energy
3. US have spent \$600 bil in nuke energy subsidies but their output have NOT increased and their prices did not decrease
4. When the US gives subsidies to renewable energy → we see costs decrease by up to 90% , emissions 23x less than nuke energy

Frontlines

C1) Indigenous people

F2 2005 Treaty

1. Specific to the Navajo nation, does not apply to all of the other indigenous tribes
2. US has broken 371 Native American Treaties, will not uphold this one
 - a. Trump has allocated \$1.5 billion to uranium mining in US, 80% of uranium in NA land, Trump will get it done

F2 Most uranium from other countries

1. ¾ of all uranium mining worldwide is on indigenous land, still impacting marginalized groups
 - a. Australia spill

F2 FF mining/transportation worse

1. Coal mining
 - a. Brookings: Coal decreased by 40% in squo¹⁶
 - b. US Energy Information Administration: more than half of US coals mines operating have closed¹⁷
 - c. Fox News: Coal is being pushed out by lower renewable energy prices¹⁸

¹⁶ <https://www.brookings.edu/blog/planetpolicy/2019/01/16/why-theres-no-bringing-coal-back/>

¹⁷ <https://www.eia.gov/todayinenergy/detail.php?id=38172>

¹⁸ <https://www.foxnews.com/politics/coal-industry-decline-trump-revival>

- i. Increasing nuclear energy will crowd out renewable energy subsidies, which leads to increase renewables energy prices → when renewable energy prices, coal becomes a more attractive option
 - d. Look towards South Australia, when renewable energy consumption increase, coal-fired power stations were shut down as being redundant¹⁹
- 2. Natural gas
 - a. S&P Global: forecast that natural gas consumption in the power sector will fall 3.2% in 2021 after witnessing slower growth in 2020.²⁰
 - b. Pipeline not as bad for the environment and people as uranium mines
 - i. Less than 4 barrels of oil was spilled in 6 months vs the 61.25 million barrels that were transported²¹
 - c. Non-unique
 - i. Increasing nuclear energy would not decrease the amount of natural gas pipelines, however, it WILL increase the amount of uranium mining (bad)
- 3. States have clean-emission quota
 - a. 37 states have mandates to get energy from renewable energy

F2 Clean up efforts in squo

1. High Country News: EPA gives clean up contracts on 30 abandoned uranium mines out to “sketchy” company known for data manipulation (1st large contract awarded for assessing the contamination of the 520 mines since uranium mining began there in 1944)
 - a. They take fake soil samples, bringing in “clean” soil to replace radioactive samples²²
 - b. Also lawsuits filed against them for removing excessive amounts of soil and other materials to increase cleanup profits
2. High Country News: EPA will see a 30% reduction in grants to fund tribes’ environmental protection and 30% cut to Superfund program, which identified polluters and obligates them to fund cleanup for mines²³
 - a. The Hill: Trump’s budget proposal will cut EPA by 26%²⁴
3. AP²⁵: it would take the EPA more than a century to fund the removal of contamination at just 21 of the highest priority sites
 - a. There are more than 4,000 sites that need to be cleaned

¹⁹ <https://reneweconomy.com.au/dispelling-the-nuclear-baseload-myth-nothing-renewables-cant-do-better-94486/>

²⁰

<https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/011420-eia-forecasts-declining-gas-consumption-in-us-power-sector-in-2021>

²¹ <https://www.forbes.com/sites/brighammccown/2018/06/04/what-ever-happened-to-the-dakota-access-pipeline/#57d4d75e4055>

²² <https://www.hcn.org/issues/51.20/indigenous-affairs-feds-give-navajo-uranium-clean-up-contract-to-firm-with-sketchy-past>

²³ <https://www.hcn.org/articles/pollution-epa-budget-cuts-threaten-to-slow-uranium-cleanup-at-navajo-nation>

²⁴ <https://thehill.com/policy/energy-environment/482352-trump-budget-slashes-funding-for-epa-environmental-programs>

²⁵ <https://apnews.com/0d66edabe1b54c3ab4e9c84658dbd40f/feds-reach-settlement-navajos-over-uranium-mine-cleanup>

F2 Better tech and regulations in the future- no accidents

1. Building safe nuclear reactors would take at least 15 years
 - a. Will not be able to decrease emissions in 12 years
2. When France built more nuclear power plants, they actually **decreased** regulations in order to speed up the process, this is more dangerous²⁶

F2 Uranium mining fine - comes from recycled fuel

1. Trump's \$1.5 billion plan specifically stipulates the mining of uranium in America to become "energy independent"

C2) Renewables better

F2 Nuclear energy less emissions

1. Studies do not include the emissions generated while building nuclear reactors/power plants
 - a. 23x more emissions than renewable energy

F2 Renewable energy variable

Myth: Renewable energy resources like wind and solar undermine grid reliability

<https://www.nrdc.org/experts/kevin-steinberger/debunking-three-myths-about-baseload>

Reality: The record shows time and time again that **wind and solar power contribute to a dependable power supply and help prevent blackouts and other grid problems**. Just one of many examples: the California grid

operator, which manages a grid with nation's highest levels of solar power, [confirms](#) that solar energy can provide many grid reliability services like voltage support and frequency response, both of which are necessary to ensure a constant and stable power flow. In fact, renewable resources often can provide reliability services better than conventional natural gas or coal resources. We also know that high penetrations of renewables can be managed reliably. For example, **wind energy in Texas often provides more than**

30 percent or even 40 percent of the state's daily power needs throughout the entire day.

Meanwhile, numerous [studies](#) also show very high levels of renewable energy can be reliably integrated into the electricity transmission system. Research from the non-partisan National Renewable Energy Laboratory (NREL) shows that with continued innovation in grid practices, increased flexibility in our power system, and improved power management among different grid regions of the country, we will be able to [power our country primarily with wind and solar power.](#)

²⁶ <https://www.vox.com/2016/2/29/11132930/nuclear-power-costs-us-france-korea> - adversarial

F2 Renewable Energy takes up more land

1. Land for nuclear power is actually harder to find (Zyga)
 - a. The power plant itself requires 21 km² of land
 - b. Nuclear reactors must be near a massive body of coolant water
 - c. BUT it also needs to be away from dense population zones and natural disaster zones

F2 Renewable timeframe arg

1. US can hit 50% Renewable energy by 2030

<https://www.fool.com/investing/2019/07/20/nextera-energy-us-can-hit-50-renewable-energy-by-2.aspx>

<https://cleantechnica.com/2019/07/22/nextera-energy-predicts-50-renewable-energy-in-us-by-2030/>

Cards

Curtis **Kline**, Intercontinental Cry, 7-2-2013, "URANIUM MINING AND NATIVE RESISTANCE: THE URANIUM EXPLORATION AND MINING ACCOUNTABILITY ACT"

<https://intercontinentalcry.org/uranium-mining-and-native-resistance-the-uranium-exploration-and-mining-accountability-act/>

Native Americans in the northern great plains have the highest cancer rates in the United States, particularly lung cancer.

It's a problem that the United States government has woefully ignored, much the horror of the men and women who must carry the painful, life-threatening burden. **The cancer rates started increasing drastically a few decades after uranium mining began on their territory.**

According to a report by Earthworks, "Mining not only exposes uranium to the atmosphere, where it becomes reactive, but releases other radioactive elements such as thorium and radium and toxic heavy metals including arsenic, selenium, mercury and cadmium. Exposure to these radioactive elements can cause lung cancer, skin cancer, bone cancer, leukemia, kidney damage and birth defects." Today, in the northern great plains states of Wyoming, Montana and the Dakotas, the memory of that uranium mining exists in the form of 2,885 abandoned open pit uranium mines. **All of the abandoned mines can be found on land that is supposed to be for the absolute use of the Great Sioux Nation**

under the 1868 Fort Laramie Treaty with the United States. The Area Agreed Upon in the Fort Laramie Treaty of 1868 (photo republicoflakotah.com) There are also 1,200 abandoned uranium mines in the Navajo Nation, where cancer rates are also significantly disproportionate. In fact, it is estimated that 60 to 80 percent of all uranium in the United States is located on tribal land, and three fourths of uranium mining worldwide is on Indigenous land.

Defenders of the Black Hills, a group whose mission is to preserve, protect, restore, and respect the area of the 1851 and 1868 Fort Laramie Treaties, is calling the health situation in their own territory America's Chernobyl. It's not far from the truth. A nuclear physics professor from the University of Michigan, Dr. K. Kearfott, Ph. D., who studied the situation in northwestern South Dakota as well as the situation in Japan has said, **The contamination from the mines escapes into the air. It poisons grain that is fed to cattle that provide milk and beef for the rest of the nation.** The abandoned uranium mines of the Cave Hills in northwestern South Dakota empty into the Grand River which flows through the Standing Rock Indian Reservation. **Three villages are located on the Grand River and their residents have used the water for drinking and other domestic purposes for generations. The water runoff from the Slim Buttes abandoned uranium mines empty into the Moreau River which flows through the Cheyenne River Indian Reservation.** Both of these rivers empty into the Missouri River which empties into the Mississippi.

Public Citizen, 1991, "Radioactive Racism: The History of Targeting Native American Communities with High-Level Atomic Waste Dumps"

<https://www.nirs.org/wp-content/uploads/radwaste/scullvalley/historynativecommunitiesnuclearwaste06142005.pdf>

Low-income and minority communities are disproportionately targeted with facilities and wastes that have significant and adverse human health and environmental effects.¹ This places the burdens of society on those who are most vulnerable. These communities are at a tremendous economic and political disadvantage over the decision-making process that is dominated by large, wealthy corporations and/or government agencies. Ironically, **low income and People of Color communities targeted with hazardous facilities often benefit the least from whatever societal "good" is purported to justify the generation of the hazardous substances in the first place.**² According to the 1990 U.S. Census (the very time period when the U.S. nuclear establishment intensified and accelerated its targeting of Native American communities with high-level radioactive waste dumps, as shown below), over 31% of Native Americans living on reservations had

incomes below the federal poverty line.³ After centuries of oppression and domination, stripped of their lands, resources, and traditional governments, these communities lack political power, and desperately need economic development. **The “tribal sovereignty” of Native Americans, which makes their lands exempt from state law and many environmental regulations, only increases their attractiveness as targets for facilities unwanted elsewhere.** Native Americans have already disproportionately borne the brunt of the impacts from the nuclear fuel chain over the past 60 years.⁴ In the case of radioactive waste storage and disposal, the nuclear power establishment in industry and government is simply taking advantage of these vulnerable communities, attempting to hide from environmental regulation and widespread public opposition behind the shield of tribal sovereignty.

Anita **Moore-Nall**, Montana State University, *Geosciences*, 2-3-2015, “The Legacy of Uranium Development on or Near Indian Reservations and Health Implications Rekindling Public Awareness”

<https://www.mdpi.com/2076-3263/5/1/15/htm>

The Navajo Nation was one of the Indian nations heavily affected by this activity with more than a thousand mines and four uranium mills on the reservation lands [5,6,8]. When mining came to the reservation the Navajo men were ready to gain employment and the close work seemed ideal. What they didn't realize was that they were being exposed to radiation when they worked and brought it home with them in their clothing to their families [6]. Energy material may contain harmful chemical substances that, if mobilized into air, water, or soil, can adversely impact human health and environmental quality [18]. As a result of the mining activity much of the population of the Navajo Nation residing near the areas of mining or milling has had their health compromised. Many of the miners developed cancers; some were lung cancer from inhalation of radioactive particles, i.e., exposure to radon [6]. **Of the 150 Navajo uranium miners who worked at the uranium mine in Shiprock, New Mexico until 1970, 133 died of lung cancer or various forms of fibrosis by 1980**

[19]. Other potential health effects include bone cancer and impaired kidney function from exposure to radionuclides in drinking water [12].

The government and the mining companies failed to inform the people of the Navajo Nation that working with uranium might be hazardous to one's health [2,3,4,5,6,7,8]. **The Public health Service even conducted a study to document the development of illnesses as the mining progressed without consent or presenting the data to the miners involved** [5,8]. **Most of the 1000 unsealed tunnels, unsealed pits and radioactive waste piles still remain on the Navajo reservation today, with Navajo families living within a hundred feet of the mine sites** [9,20]. **Some of the homes were built with tailings material and much of the water is contaminated on the reservation**

Robert **Alvarez**, Bulletin of the Atomic Scientists, 3-30-2017, “Native American uranium miners and the Trump budget”

<https://thebulletin.org/2017/03/native-american-uranium-miners-and-the-trump-budget/>

Native American uranium miners were essential to the United States' efforts to create a nuclear arsenal. From the late 1940s to the early 1970s,

Indian people dug up approximately four million tons of uranium ore—nearly a quarter of the total national underground production in the United States used in nuclear weapons. As they did so, they were sent into harm's way without sufficient warning, becoming the workers most severely exposed to ionizing radiation in the US nuclear weapons complex. After more than a century, the legacy of US uranium mining lingers. **More than three billion metric tons of mining and milling wastes were generated in the United States. Today, Navajos still live near about one third (approximately 1,200 out of 4,000) of all abandoned uranium mines in the United States.** Only after concerted efforts by Navajo activists to spur congressional investigations in 1993 and 2006 did the US government promise to remediate abandoned mines and ascertain their health impacts. But more than a century after the government issued the first uranium mining leases on Navajo land, **the Trump administration has proposed deep cuts in the Environmental Protection Agency's**

budget—upward of 30 percent overall—putting that cleanup effort in peril. America’s Indian miners were never warned of the hazards of radioactivity in the mines, where they inhaled, ingested, and drank uranium dust. The water in the mines was especially dangerous; it contained high quantities of radon—a radioactive gas emanating from the ore. Radon decays into heavy, more radiotoxic isotopes, called “radon daughters,” which include isotopes of polonium, bismuth, and lead. The alpha particle emissions of radon daughters are considered to be about 20 times more carcinogenic than x-rays. If they lodge in the respiratory system, especially the deep lung, radon daughters emit energetic ionizing radiation that can damage cells of sensitive internal tissues. And of course, the miners brought the uranium dust home, along with their contaminated clothing. A known danger, hidden. The hazards of uranium mining have been known for centuries. As early as 1556, dust in the Ore Mountain (Erzgebirge) mines bordering Germany and what is now the Czech Republic was reported to have “corrosive qualities... it eats away the lungs and implants consumption in the body...” **By 1879, researchers found that 75 percent of the miners in the Ore Mountains had died from lung cancer.** By 1932, the Ore Mountain miners were receiving compensation for their cancers from the German government. Uranium mining was convincingly linked to lung cancer by dozens of epidemiological and animal studies by the late 1930s. In 1942, Wilhelm C. Hueper, the founding director of the environmental cancer section of the National Cancer Institute, brought the European studies to light in the United States—concluding that radon gas was responsible for half of the deaths of European miners after 10 to 20 years of exposure. By this time, uranium had become a key element for the making of the first atomic weapons. Hueper’s superiors blocked him from further publication and discussion in this area; they told him that dissemination of such information was “not in the public interest.”

Laurel **Morales**, NPR, 11-18-2019, “Many Native Americans Can’t Get Clean Water, Report Finds”

<https://www.npr.org/2019/11/18/779821510/many-native-americans-cant-get-clean-water-report-finds>

For many people, turning on the tap or flushing the toilet is something we take for granted. But a [report released Monday](#), called “Closing the Water Access Gap in the United States,” shows that **more than 2 million Americans live without these**

conveniences and that Native Americans are more likely to have trouble accessing water than any other group. The nearest water station for Darlene Yazzie is 9 miles away at the Dennehotso Chapter House — a community center — in the Four Corners region of the Navajo Nation. On Tuesday, she counted her dimes and nickels to pay for water. It costs \$1.10 plus gas money to fill up two 50-gallon barrels, and she has just been told the price is going up next month.

Laurel **Morales**, NPR, 11-14-2017, “For Some Native Americans, Uranium Contamination Feels Like Discrimination”

<https://www.npr.org/sections/health-shots/2017/11/14/562856213/for-some-native-americans-uranium-contamination-feels-like-discrimination>

When she was pregnant, Nez and her children drank from **a spring, located on Navajo Nation in northeastern Arizona, with uranium levels at least five times greater than safe drinking water standards,**

according to a study published in the journal Environmental Science & Technology in 2015. Four of her children died as toddlers. Three died in early adulthood. Their stomachs became bloated, and their eyes turned a cloudy gray. The three remaining children, now adults, have health problems. “It is worrisome and troublesome, and you hope that something will be done,” Nez said. In a new poll by NPR, the Robert Wood Johnson Foundation and the Harvard T.H. Chan School of Public Health, more than **1 in 4 Native Americans say the quality of their drinking water is worse than in other places.** From 1944 to 1986, mining companies blasted 30 million tons of uranium out of Navajo land. When the U.S. Energy Department had stockpiled enough for the Cold War, the companies left, abandoning 521 mines. Since then, many Navajo have died of conditions linked to [contamination](#).

Elizabeth **Hoover**, Environmental Health Perspectives, 12-1-2012, “Indigenous People of North America: Environmental Exposures and Reproductive Justice”

<https://ehp.niehs.nih.gov/doi/full/10.1289/ehp.1205422>

In addition to deposition of petrochemical and military waste, mining tends to heavily impact native communities. Uranium mining and mine tailings are major problems in both South Dakota and New Mexico. There was extensive uranium mining in the Southwest in the past, often on Indian land, and the mounds of mine tailings leached uranium into drinking and groundwater (Landa and Gray 1995). **Uranium is both**

radioactive and has direct metal toxicity, which results in increased risk of cancer, birth defects, and kidney disease (Craft et al. 2004). In addition to mining effluents, the Tewa community in northern New Mexico is also exposed to toxic and radioactive wastes coming from releases from the Los Alamos National Laboratory, spread by air and surface and groundwater. Although a systematic health study has not been conducted in these populations, some **environmental testing** has been commissioned by local nonprofit organizations, which **found PCB levels 25,000 times the standard for human health and 1,000 times over the standard for wildlife habitat in Los Alamos Canyon** (Amigos Bravos and Concerned Citizens for Nuclear Safety 2006). Amigos Bravos won a settlement in May 2011 against the U.S. EPA and Los Alamos over discharge permits that will require clean up of a number of sites, increase monitoring, and install pollution control measures (van Buren 2011)

Bruce E. **Johnson**, Professor of Communications at University of Nebraska, 6-1997, "The High Cost of Uranium in Navajoland"

<https://ratical.org/radiation/UraniumInNavLand.html>

In early 1978, however, **the Department of Energy released a Nuclear Waste Management Task Force report** which said **that persons living near the tailings piles have twice the expected rate of lung cancer.** By 1978, the Navajos were beginning to trace the roots of a lung cancer epidemic which had perplexed many of them, since the disease was very rare among Navajos before World War II. In addition to exposure from the tailings piles, many of the miners who started America's nuclear stockpile had died of lung cancer. Although health and safety measures have improved in the mines since the 1950s, due to governmental and popular pressure, present practices still expose workers to unhealthy amounts of radon. As for Kerr-McGee, in whose mines many of the Navajos worked, a company statement maintained as late as mid-1979 that uranium-related deaths among miners were mere allegations. **Lung cancer results from inhalation of radon gas, a by-product of uranium's decay into radium.** Tom Barry, in an investigative series for the Navajo Times, found documentation that miners who worked for Kerr-McGee during the 1940s were exposed to between 100 and 1,000 times the dosage of radon now considered safe by the federal government. Harris Charley, who worked in the mines for 15 years, told a United States Senate hearing in 1979, "We were treated like dogs. There was no ventilation in the mines." Pearl Nakai, daughter of a deceased miner, told the same hearing that "No one ever told us about the dangers of uranium." The Senate hearings were convened by Sen. Pete Domenici, New Mexico Republican, who is seeking compensation for disabled uranium miners, and for the families of the deceased. "The miners who extracted uranium from the Colorado Plateau are paying the price today for the inadequate health and safety standards that were then in force," Domenici told the hearing, held at a Holiday Inn near the uranium boom town of Grants, N.M.

Anita **Moore-Nall**, Montana State University, *Geosciences*, 2-3-2015, "The Legacy of Uranium Development on or Near Indian Reservations and Health Implications Rekindling Public Awareness"

<https://www.mdpi.com/2076-3263/5/1/15/htm>

Over ninety percent of all milling done in the U.S. occurred on or just outside the boundaries of American Indian reservations [33]. Mills logically would be located near the production or mine sites for infrastructure, thus many mills were on or near the reservations where uranium mining was operating. A disaster of huge consequence for the Navajo Nation occurred at the Church Rock uranium mill spill on 16 July 1979, in New Mexico when United Nuclear Corporation's Church Rock uranium mill tailings disposal pond breached its dam [34]. **Over 1000 tons of solid radioactive mill waste and 93 million gallons of acidic, radioactive tailings solution flowed into the Puerco River, and contaminants traveled 130 km downstream onto the Navajo Nation** [35]. The mill was located on privately owned land approximately 27 km north of Gallup, New Mexico, and bordered to the north and southwest by Navajo Nation Tribal Trust lands [35]. **Local**

residents, who were mostly Navajos, used the Puerco River for irrigation and livestock and were not immediately aware of the toxic danger [34]. The Navajo Nation asked the governor of New Mexico to request disaster assistance from the U.S. government and have the site declared a disaster area, but he refused, limiting disaster relief assistance to the Navajo Nation [34]. **In terms of the amount of radiation released, the accident was larger in magnitude than the Three Mile Island accident of the same year [34] but received little public attention.** This was likely due to the remoteness and sparsely populated area of the Navajo Nation which was impacted by the spill. The area was inhabited by mainly Navajo people, many who only spoke their native tongue [34]. This is in contrast to the highly populated area of Middletown, Pennsylvania located three miles from the Three Mile Island Nuclear Generating Station where the TMI accident occurred. Possibly the greater significance of a nuclear power plant versus a tailings dam may also have influenced media coverage.

Nathaniel Morris, 3-9-2017, Stanford University, "Church Rock Spill"

<http://large.stanford.edu/courses/2017/ph241/morris-n1/>

Because of the large area the radiation spill contacted, the environmental and health effects have been wide reaching. **Elevated radiation has been monitored as far as 50 miles away from the initial spill and the radiation in the Puerco River showed 7,000 times the standard amount for drinking water.** [4] This radiation contaminated not only the water but the food chain as well as seen through cattle in the area showing higher levels of radiation. **Because roughly half of the Navajo population in the area get their water from unregulated sources, which became contaminated, they suffered from exposure to high levels of poisonous uranium mill tailings in the water supply. This resulted in elevated rates of kidney disease as well as at the affected Navajo population being 1.83 times more likely to have 1 of 33 selected defects**

The United Nuclear Corporation along with the government of New Mexico did embark on a cleanup effort as shown in Fig. 1. **However this attempt to fix their mistake is criticized as being vastly inadequate** for the severity of damages caused by the Church Rock Spill. **Scholars argue that their response was an insufficient response to the drastic situation considering the impoverished Navajo people were not able to advocate for themselves. Additionally many of the Navajo people were not able to speak English and authorities did not communicate properly in order to warn the residents in the area to protect themselves from the radiation and poisonous water.**

Half of recoverable uranium is in New Mexico and half of that is located on Navajo land. Because of this the Navajo people have been subjected, since 1940 when uranium mining began in New Mexico, to the negative health effects of the radioactive metal. One in six Navajo uranium miners have been afflicted with lung cancer. While the Church Rock spill was the largest destructive incident other instances of uranium poisoning in Navajo lands have been a continuous problem and this one spill was not an isolated incident.

ABC News, 2-14-2020, "Trump wants \$1.5B over 10 years to revive US uranium mining"

<https://abcnews.go.com/Business/wireStory/trump-15b-10-years-revive-us-uranium-mining-68980696>

<https://www.independent.co.uk/news/world/americas/us-politics/trump-grand-canyon-uranium-mining-native-american-tribe-havasupai-water-a8956386.html> (talks abt Native Americans)

SALT LAKE CITY (AP) — **The Trump administration wants to spend \$1.5 billion over 10 years to create a U.S. uranium reserve, claiming that reliance on cheaper uranium imports threatens the country's energy security.** But some market analysts, lawmakers and others say the Republican president is seeking a taxpayer handout for uranium companies that can't compete in the global market. And residents near a Utah uranium mine say they fear an increase in radioactive threats. Demand for the nuclear fuel has plunged globally since Japan's 2011 Fukushima disaster. Trump's proposal comes as a new federal report shows domestic uranium production plummeting 96% over the last five years.

Philip **Bethge**, Der Spiegel, 1-7-2020, "Can Nuclear Power Offer a Way Out of the Climate Crisis?," No Publication, <https://www.spiegel.de/international/world/can-nuclear-power-offer-a-way-out-of-the-climate-crisis-a-06a8a27f-d492-45d3-8134-30187eefbdf3>

The optimistic scenario touted by fans of nuclear power is reminiscent of the 1950s, when nuclear fission triggered similar dreams of liberating people of all their worries about energy. Walt Disney even dedicated the 1957 film "Out Friend the Atom" to championing the cause of nuclear energy. But the euphoria didn't last long. Three Mile Island, Chernobyl, Fukushima: The history of the use of nuclear energy has been marked by setbacks, accidents and catastrophe. The unresolved issue of a final repository for nuclear waste, the danger of proliferation and the spread of atomic material for military purposes has also fueled skepticism about the energy source. The primary problem with nuclear power, though, is its price tag. **Conventional plants are simply too expensive and nuclear power cannot be**

profitable without government subsidies. Currently, a kilowatt hour of nuclear power costs more than 10 cents to produce in Germany, whereas electricity from onshore wind turbines and gas- or coal-fired plants costs only four to eight cents. As such, the construction of nuclear power plants has long been considered a risky investment. Some 449 reactors are currently in operation around the world, with 53 under construction. In 2018, the average construction time for a plant was eight and a half years. The two reactors that make up Britain's Hinkley Point C are a prime example of misguided nuclear policy. The units are on track to becoming the most expensive construction projects ever, with costs having skyrocketed to around 26 billion euros. Construction is eight years behind schedule. Three governments (those of the United Kingdom, France and China) as well as two energy companies have invested in the project. **Without the guaranteed feed-in tariffs, the plants would never pay off.** "The construction of nuclear power plants makes no sense economically," says Christoph Pistner of the Institute for Applied Ecology in Darmstadt.

Mark **Cooper**, Institute for Energy and the Environment, 10-2019, "THE ENDGAME FOR NUCLEAR POWER: A DESPERATE PUSH FOR SUBSIDIES IN THE 2019 TAX EXTENDERS"

http://foe.org/wp-content/uploads/2019/10/2019-10-22_Final-FOE-ITC-Study.pdf

Nuclear advocates frequently argue that existing nuclear reactors account for 60% of current, U.S. low-carbon electricity resources. However, economic analysis should focus on forward-looking costs, not sunk costs. In fact, **over the last 20 years, 95% of low-carbon electricity resources have come from alternatives, like wind and solar.** In the past 20 years, no nuclear reactors have been brought online in the U.S. The only reactor that might be completed in the next decade has a price tag that is over three times the cost of alternatives.

Mark Z. **Jacobson**, Stanford University, "The 7 reasons why nuclear energy is not the answer to solve climate change," Leonardo DiCaprio Foundation,

<https://www.leonardodicaprio.org/the-7-reasons-why-nuclear-energy-is-not-the-answer-to-solve-climate-change/>

To recap, **new nuclear power costs about 5 times more than onshore wind power** per kWh (between 2.3 to 7.4 times depending upon location and integration issues). Nuclear **takes 5 to 17 years longer between planning and operation and produces on average 23 times the emissions per unit electricity generated** (between 9 to 37 times depending upon plant size and construction schedule). In addition, it creates risk and cost associated with weapons proliferation, meltdown, mining lung cancer, and waste risks. Clean, renewables avoid all such risks. Nuclear advocates claim nuclear is still needed because renewables are intermittent and need natural gas for backup. However, nuclear itself never matches power demand so it needs backup. Even in France with one of the most advanced nuclear energy programs, **the maximum ramp rate²⁷ is 1 to 5 % per minute, which means they need natural gas, hydropower, or batteries, which ramp up 5 to 100 times faster, to meet peaks in demand.** Today, in fact, batteries are beating natural gas for wind and solar backup needs throughout the world. A dozen independent scientific groups have further found that it is possible to match intermittent power demand with clean, renewable energy supply and storage, without nuclear, at low cost. Finally, many existing nuclear plants are so costly that their owners are demanding subsidies to stay open. **For example, in 2016, three existing upstate New York nuclear plants requested and received subsidies to stay open using the argument that the plants were needed to keep emissions low.** However, subsidizing such plants may increase carbon emissions and costs relative to replacing the plants

²⁷ power generation to express how quickly a power plant's power output is changing

with wind or solar as soon as possible. Thus, **subsidizing nuclear would result in higher emissions and costs over the long term than replacing nuclear with renewables.**

Nathan Hultman, **Brookings**, 10-16-2018, “We’re almost out of time: The alarming IPCC climate report and what to do next”

<https://www.brookings.edu/opinions/were-almost-out-of-time-the-alarming-ipcc-climate-report-and-what-to-do-next/>

The new report focuses on what impacts we might expect from even half of that warming, at 1.5 degrees and 2 degrees, and the remarkable story is even at these lowest levels of climate change that we believe are achievable—given that we’ve already warmed about 1 degree—the impacts are significant and quickly become severe as temperatures reach beyond 1.5 degrees. Other sources, including this interactive graphic and the report summary, detail some of the headline numbers and I will not catalog all of them here. Notable is the likelihood that going from 1.5 to 2 degrees would expose several hundred million people dangerous climate-related risks by 2050, and would likely wipe out 99 percent of coral reefs. And the scale of the challenge to retool the economy on a short timeline is staggering: **the study estimates that global emissions of greenhouse gases need to drop by 45 percent from 2010 levels by 2030 to stay on a 1.5 degrees path.** Given dramatic recent increases in emissions, is equivalent to a roughly 60 percent drop from today’s levels, in 12 years.

World Health Organization, 2014, “Quantitative risk assessment of the effects of climate change on selected causes of death, 2030s and 2050s”

<https://www.who.int/globalchange/publications/quantitative-risk-assessment/en/>

WHO releases a quantitative assessment of the health impacts of climate change. This constitutes an update and a further development of the assessment that was first published by WHO for the year 2000, now with a wider range of health impacts, and projections for future years. The assessment takes into account a subset of the possible health impacts, and assumes continued economic growth and health progress. Even under these conditions, it concludes that **climate change is expected to cause approximately 250 000 additional deaths per year** between 2030 and 2050; 38 000 due to heat exposure in elderly people, 48 000 due to diarrhoea, 60 000 due to malaria, and 95 000 due to childhood undernutrition. Results indicate that the burden of disease from climate change in the future will continue to fall mainly on children in developing countries, but that other population groups will be increasingly affected.

Lisa Zyga, Phys.org, 5-11-2011, “Why nuclear energy power will never supply the world’s energy needs”

<https://phys.org/news/2011-05-nuclear-power-world-energy.html>

One nuclear reactor plant requires about 20.5 km² (7.9 mi²) of land to accommodate the nuclear power station itself, its exclusion zone, its enrichment plant, ore processing, and supporting infrastructure. **Secondly, nuclear reactors need to be located near a massive body of coolant water, but away from dense population zones and natural disaster zones.** Simply finding 15,000 locations on Earth that fulfill these requirements is extremely challenging.