UNEP

United Nations Environment Programme
Energy Sources' Impact on Wildlife

Overview

Energy production is crucial to society; without it, the modern conveniences of electricity, wifi and other comforts would be inaccessible. For many, modern life is entirely dependent on energy. However, energy generation does not come without negative environmental effects. In particular, various energy sources have seriously impacted wildlife and their ecosystems. Seeing the detriment such practices cause, nations worldwide have banded together to promote less harmful energy sources. Recently, more countries have strived to lower harmful carbon emissions through laws that limit fossil fuel-based energy production in favour of eco-friendly alternatives. Nevertheless, some of these alternatives still result in wildlife endangerment. For instance, while hydroelectric dams do not create air pollution, they kill 22% of all fish that pass through them.[1] It is the role of The United Nations Environment Programme (UNEP) and its member states to combat these unintentional impacts on wildlife by enacting legislation and urging concrete solutions to foster an eco-friendly society.[2]

The United Nations Environment Programme

The United Nations Environmental Programme (UNEP) is an agency that aims to address the root cause of various environmental issues in three general categories: pollution, biodiversity and habitat loss, and climate change. UNEP seeks to accomplish its goals by promoting global education initiatives, sustainable development and collaboration between its 193 member states.[3] This includes the implementation of tangible change through means such as the United Nations Environment Assembly, where members make high-stakes decisions that can impact the future well-being of the earth. As such, UNEP strives to prevent wildlife loss as a result of energy sources while maintaining the need for clean, green energy production.

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[1] Krebs, Eric. "The New Generation of Hydropower Dams Let Fish Swim Straight Through." Reasons to be Cheerful, February 7, 2023. https://reasonstobecheerful.world/hydroelectric-dam-turbines-fish-friendly/.
[2] "The United Nations Environment Assembly." Environment Assembly, https://www.unep.org/environmentassembly/.
[3] "About the United Nations Environment Programme." UNEP, https://www.unep.org/who-we-are/about-us.

Non-renewable Energy Sources and Negative Impacts

Fossil Fuels

Fossil fuels are detrimental to earth's biosphere: "Fossil fuels – coal, oil and gas – are by far the largest contributor to global climate change, accounting for over 75 percent of global greenhouse gas emissions and nearly 90 percent of all carbon dioxide emissions."[4] Air-polluting substances such as CO2 harm animals and humans alike, leading not only to diminished air quality, acid rain and other harmful ecological phenomena.[5] Acid rain also indirectly harms animals and their sources of food and water.[6]

The prevalence of crude oil, a common fossil fuel, has led to the prevalence of oil spills. These spills can have catastrophic effects on marine and terrestrial wildlife, causing animals to become coated in oil and restricting their movement, ease of eating and ability to breathe. They often have long-term effects on ecosystems in which they occur, leaving entire populations of species dead or sterile after these accidents.[7] Oil spills also contaminate and destroy habitats which often leads to a loss in biodiversity. For example, a pipeline manufactured by TC Energy, which runs throughout Canada and the United States, malfunctioned and spilled tons of oil near Keystone, Kansas, with nearly 100 different fish species and animals dying as a result.[8]

Nuclear Energy

Nuclear energy can pose a significant threat to wildlife if proper care is not taken to ensure its harm is limited. Otherwise, improper storage and disposal of radioactive waste, along with destruction of land for constructing power plants, can seriously harm local ecosystems. Not only are many animal habitats in the area destroyed from the land clearing, but once the power plant is built, improper disposal practices often lead to soil and water pollution, affecting all

[4] "Causes and Effects of Climate Change." United Nations, https://www.un.org/en/climatechange/science/causes-effects-climate-change#:~:text=Fossil%20fuels%20%E2%80%93%20coal%2C%20oil%20and,of%20all%20carbon%20dioxide%20emissions .
[5] What is acid rain? | US EPA. Accessed November 13, 2023. https://www.epa.gov/acidrain/what-acid-rain.
[6] Batema, Cara. "Is Acid Rain Harmful to Animals?" Sciencing, March 2, 2019. https://sciencing.com/acid-rain-harmful-animals-3769.html.
[7] "How Oil Harms Animals and Plants in Marine Environments." Office of Response and Restoration, May 4, 2021. https://response.restoration.noaa.gov/oil-and-chemical-spills/oil-spills/how-oil-harms-animals-and-plants-marine-environments.html.
[8] Wildlife was harmed in the Kansas Keystone Pipeline Oil Spill | the ... Accessed November 13, 2023. https://www.kansascity.com/news/state/kansas/article270214057.html.

organisms living in these ecosystems.[9] A famous example of radioactive waste's negative effect is the Chernobyl disaster in Ukraine in 1986, wherein a malfunction caused radioactive materials to leak into the environment lending to the death of 200,000 people[10] and 93,000 animals.[11]

While nuclear power is often considered to be a clean alternative to traditional fossil fuels, proper safeguards must be instituted in order to prevent similar catastrophes. Is the potential benefit of nuclear power really worth the risk to humans and animals? As the entire region surrounding Chernobyl has been determined to be inhospitable "...for up to 20,000 years", governments may want to consider the unlikely but immensely damaging potential outcomes of this volatile source of power.[12]

Renewable Energies' Negative Impact

Wind Power

Wind turbines are often touted as optimal energy sources due to their renewability, as wind energy can always be harnessed. However, turbines can also have adverse effects on birds, bats, and other flying animals. Their spinning blades lead to unfortunate collisions that often result in death. Bats migrating are having their lives cut short due to these dangerous obstruction in their flight paths: "Dead bats are found beneath wind turbines all over the world. It's estimated that tens to hundreds of thousands die at wind turbines each year in North America alone."[13] Bats are particularly vulnerable since over 200 species of bats face threat of extinction.[14]

Fortunately, scientists are finding innovative solutions to prevent turbine collisions. Researchers at the Department of Energy's National Renewable Energy Laboratory, run by the

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[9] "U.S. Energy Information Administration - EIA - Independent Statistics and Analysis." Nuclear power and the environment - U.S. Energy Information Administration (EIA), November 7, 2022. https://www.eia.gov/energyexplained/nuclear/nuclear-power-and-the-environment.php.

[10] "Frequently Asked Chernobyl Questions." IAEA, November 7, 2016. https://www.iaea.org/newscenter/focus/chernobyl/faqs.

[11] Vinocur, Nick. "Chernobyl Animals Worse Affected than Thought: Study." Reuters, March 18, 2009. https://www.reuters.com/article/us-chernobyl-radiation-idUSTRE52H09020090318.

[12] Blakemore, Erin. "Chernobyl Disaster Facts and Information." Culture, May 3, 2021. https://www.nationalgeographic.com/culture/article/chernobyl-disaster#:~:text=More%20than%2030%20years%20on,power%20after%20World%20War%20II.

[13] "How Are Bats Affected by Wind Turbines?" How are bats affected by wind turbines? | U.S. Geological Survey. Accessed October 11, 2023. https://www.usgs.gov/faqs/how-are-bats-affected-wind-turbines#:~:text=Dead%20bats%20are%20found%20beneath,year%20in%20North%20America%20alone.

[14] "Endangered Species Interventions." Bat Conservation International, June 16, 2023. https://www.batcon.org/our-work/endangered-species-interventions/#:~:text=More%20than%20200%20bat%20species,these%20populations%20and%20prevent%20extinctions.

USA's Department of Energy, are exploring the use of ultrasonic acoustic deterrents to reduce bat fatalities at the hands of wind turbines.[15] The deterrents scare off bats by emitting sounds that bat species can hear all with the goal of discouraging them from approaching wind turbines.[16] Other tactics, like placing wind farms in areas far away from migration routes, could be used to avoid harming bats, birds and other migratory species.[17]

Hydroelectricity

Hydroelectric power is one of the most common and far reaching sources of renewable energy in the world, with over 70% of all of earth's renewable energy being generated from water.[18] Hydroelectricity is a significantly cleaner source of energy than coal or crude oil, as no fracking or mining is needed to harness water into energy. Despite this, it is still important to recognize the destruction and death that hydroelectric dams can cause. For instance, their placement often has detrimental effects on surrounding ecosystems, such as forests, agricultural land and animal habitats.[19] Balancing the benefits of renewable energy with UNEP's duty to preserve wildlife is a crucial consideration in the ongoing development of more environmentally sound energy sources.

Furthermore, the construction of dams involves altering river courses and flooding large areas. This leads to the destruction of habitats and has even altered fish migration patterns.[20] However, while potential loss of biodiversity, displacement of wildlife, and destruction of forests might dissuade one from thinking hydroelectricity is viable, efforts are being made to lessen these environmental consequences. An example of a company attempting to fix such issues is Nantel Energy, a California-based hydropower company that is researching and developing new water turbines.[21] These turbines will theoretically allow fish up to 20 cm long to swim through

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[15] "About NREL." NREL. Accessed October 11, 2023. https://www.nrel.gov/about/.
[16] "Which Bats Steer Clear of Wind Turbine Deterrents-and When?" Energy.gov, June 1, 2020. https://www.energy.gov/eere/wind/articles/which-bats-steer-clear-wind-turbine-deterrents-and-when.
[17] "Wind Energy and Wildlife Share Future in the Skies and Seas." NREL, October 9, 2020. https://www.nrel.gov/news/program/2020/wind-energy-wildlife-share-future.html.
[18] "Hydroelectric Energy." Education. Accessed October 9, 2023. https://education.nationalgeographic.org/resource/hydroelectric-energy/.
[19] "Environmental Impacts of Hydroelectric Power." Union of Concerned Scientists. Accessed October 9, 2023. https://www.ucsusa.org/resources/environmental-impacts-hydroelectric-power#:~:text=Flooding%20land%20for%20a%20hydroelectric,agricultural%20land%2C%20and%20scenic%20lands.
[20] Marsh, Jacob. "The Environmental Impacts of Hydropower." EnergySage, September 27, 2019. https://www.energysage.com/about-clean-energy/hydropower/environmental-impacts-hydropower/ .
[21] "Natel FishSafeTM: High-Performance Fish-Safe Hydro Turbine Design." Natel FishSafeTM | High-performance fish-safe hydro turbine design. Accessed October 9, 2023. https://www.natelenergy.com/turbines.

them safely.[22] Although over 20% of fish that pass through current hydroelectric dams die, this innovation would alleviate many environmental concerns surrounding hydroelectric dams as well as increase the lifespan of fish and other wildlife that surround them.[23]

Global Response

The Ramsar Convention on Wetlands, signed in 1971, aims to preserve ecosystems saturated with water. It adopts a broad definition for what can be included as 'wetlands', including various bodies of water such as lakes, rivers, swamps, marshes and more.[24] It claims that wetlands protect humans by improving water quality, fighting floods and preventing shoreline erosion.[25] Therefore, protecting wetlands is not only beneficial to animals but also to humans, giving the global community the responsibility to protect these bodies of water.

Mitigation Measures

Environmental Impact Assessments (EIAs) are a tool used by regulatory bodies to assess the environmental consequences of a particular decision.[26] Without this mode of evaluation, governments would be unaware of the harms caused and the energy sector would be left unchecked. Consequently, if under frequent assessment by EIAs, new energy plants of any kind will be more likely to be well-maintained and eco-friendly both in construction and in operation, ensuring they improve the environment as intended.

Global bodies have also banded together to resolve relevant environmental concerns. The International Union for Conservation of Nature (IUCN) is a global organization whose members discuss pressing issues facing the environment in hopes of promoting change. Among its efforts, the IUCN attempts to remove species from the endangered list, slow down climate change and protect the ocean as well as other nature conservation sites. "Its experts are organized into six

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[22] "Fish-Safe Turbines Empower Small-Dam Hydro Projects." ASME. Accessed October 9, 2023. https://www.asme.org/topics-resources/content/fish-safe-turbines-empower-small-dam-hydro-projects.
[23] Krebs, Eric. "The New Generation of Hydropower Dams Let Fish Swim Straight Through." Reasons to be Cheerful, February 7, 2023. https://reasonstobecheerful.world/hydroelectric-dam-turbines-fish-friendly/
[24] "The Convention on Wetlands and Its Mission." The Convention on Wetlands, The Convention on Wetlands, July 13, 1994. https://www.ramsar.org/about/convention-wetlands-and-its-mission.
[25] Why are wetlands important? | US EPA - U.S. Environmental Protection Agency. Accessed November 1, 2023. https://www.epa.gov/wetlands/why-are-wetlands-important.
[26] "International Environmental Impact Assessment." NEPA | National Environmental Policy Act - International Environmental Impact Assessment. Accessed November 12, 2023. https://ceq.doe.gov/get-involved/international_impact_assessment.html.

Commissions dedicated to species survival, environmental law, protected areas, social and economic policy, ecosystem management, and education and communication."[27] IUCN and its members have passed over 1400 resolutions in hopes of a more sustainable future.[28]

In sum, nations worldwide should take further action on the issue of the energy sector's effect on wildlife. Through promoting collaboration between government agencies, energy developers and conservationists, wildlife whose lives were once endangered by human expansion may live peacefully in their natural habitats. UNEP urges its members to implement eco-friendly and viable energy sources to ensure that all species coexist on a healthy, sustainable planet.

Questions to Consider

1. What is your country's main energy source?
2. Are there environmental protection laws put into place in the energy sector of your country?
3. Has the energy sector negatively affected your country's wildlife? If so, how and what steps were taken to prevent future harm?
4. Should countries who can afford to put preventative measures in place but chose not to be sanctioned?

Useful Delegate Resources

About the United Nations Environment Programme | UNEP

Hydroelectric Energy

Our Work | IUCN

[27] Environment, UN. "The International Union for Conservation of Nature (IUCN)." UNEP. https://www.unep.org/explore-topics/oceans-seas/what-we-do/working-regional-seas/partners/international-union#:~:text=IUCN%20is%20the%20global%20authority,management%2C%20and%20education%20and%20communication.

[28] "Our Work." IUCN, May 3, 2023. https://iucn.org/our-work.

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