Energy Overview

The energy we use to power our daily lives is generated in numerous ways – through sunlight by using solar panels, wind by using wind turbines, or by harnessing nuclear energy. However, it is most often created by burning fossil fuels: coal, oil, and natural gas. The reliance on fossil fuels for many years has triggered several negative side effects, including pollution, climate change, and habitat destruction. Accessing fossil fuels is also damaging. Entire habitats can be lost through processes like wholesale deforestation when extracting fuel underground.

Burning fossil fuels has negative health consequences for humans as well. Humans can develop asthma, cancer, heart disease, and experience premature death when consistently exposed to the environmental pollutants produced by the burning, waste, and use of fossil fuels. With a growing human population, there is potential for increased energy consumption, including the use of fossil fuels. This can lead to a rise in environmental and human health risks.

To combat these consequences, advocacy for renewable energy resources such as wind, solar, and water has increased. Renewable energy pollutes less and releases less carbon dioxide, but it is not perfect. There are instances in which, when poorly set up, renewable energy sources can still disrupt habitats. Mining to build the technology for renewable energy has negative environmental and social impacts. When not incorporated into existing systems and structures, solar and wind energy require large plots of land to capture energy. Others argue that solar and wind farms can be perceived as an eyesore.

Energy plays a major role in the development of a community. Energy powers large-scale community services like food production, water distribution, and transportation, and smaller-scale services like heating and cooling homes, cooking, and refrigeration. Yet many places today remain without access to energy.

Access to affordable, reliable, and sustainable modern energy for all is Goal 7 of the United Nations Sustainable Development Goals (SDGs). When connected to a larger energy grid, day-to-day functions are made easier and safer. Achieving SDG 7 will help in the development of many countries as a whole; however, there are environmental and human health risks to take into account while doing so.

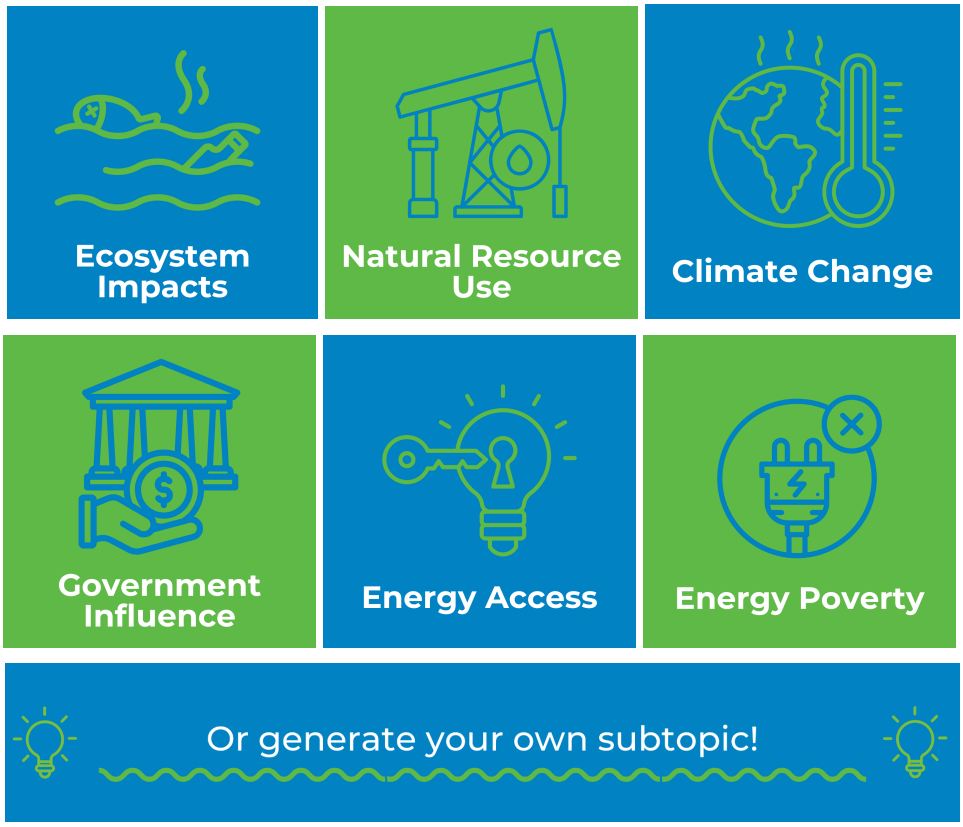
Narrow Your Focus

Energy is a broad topic that encompasses many challenges, but you only have one minute to address this global topic in your video. Rather than tackling the entire topic of energy, we recommend focusing on a specific part of it (a subtopic). **Remember, your World of 8 Billion video should also connect how human population growth impacts energy and offer a sustainable solution.**

We've curated a list of subtopic angles for energy that you could take (see below), and linked them to a variety of credible sources. But there are many other energy subtopics and numerous additional sources, so no need to limit yourself to what's included in this document.

As you conduct your research, remember to keep a works cited list. You will need to submit your sources if your video is chosen as a finalist.

Click on the colored tiles below to navigate to information about each subtopic, or click the bottom rectangle for a planning document to help generate your own ideas!



Looking for more resources to help you plan your video? Check out the full video project organizer or the abbreviated version, the video project guide.

Ecosystem Impacts

Producing, storing, transporting, and accessing fossil-fuel-based energy all have direct negative consequences on ecosystems. These include habitat loss, ocean acidification, air pollution, and water pollution. As the human population grows, more energy is used to support people's daily needs, increasing the impact of those consequences.

- Extraction of nonrenewable resources can contribute to the pollution of waterways. For example, oil spills or any amount of oil entering the ocean damages the marine life in that ecosystem. (Source: European Environmental Agency)
- As the use of Artificial Intelligence (AI) is on the rise, more electricity is required to run the AI data centers, and therefore, more water is needed to cool the hardware in those centers. Surrounding towns and ecosystems suffer the consequences of a diminishing water supply. (Source: MIT News)
- The phytoplankton in oceans are vital for converting atmospheric CO2 and they rely on the nutrients from whale waste for survival. Harm to whale habitats due to global warming leads to a declining whale population. Without whales, less phytoplankton will survive, reducing the amount of carbon stored in the oceans. (Source: NBC)
- Every source of energy requires the use of land, including the location of the power plant, the extraction of materials, and the placement of waste produced. (Source: World Economic Forum)
- Power plants, like the coal power plant in Cirebon, Indonesia, impact wildlife and soil quality, which will also impact the fishermen and farmers living and working in the area. (Source: The Jakarta Post)

Natural Resource Use

All energy sources require the use of natural resources. Resources like coal, oil, gas, metals, water, land, wind, and sunlight have varying levels of impact when used. Human population growth increases the need for these natural resources and sparks a conversation about which natural resources are reliable as an energy source.

- Burning fossil fuels generates energy that humans rely on for electricity, heating, cooling, product creation, services, and more. The rate at which these fossil fuels are being extracted cannot keep up with the demand for them. (Source: One Planet)
- The limited amount of fossil fuels and the difficulty in extracting them make them an unsustainable source of energy for humans. (Source: BBC)
- All sources of energy use limited natural resources either for the energy source itself or to build systems that harness and store energy. (Source: Resilience)
- Natural resource consumption, specifically the use of oil, is not even across the globe. The United States, China, and India consume the most barrels of oil per day, using 40,207 barrels total among the three countries. Meanwhile, countries like Niue, Montserrat, and the Falkland Islands all use an average of zero barrels of oil per day. (Source: World

Population Review)
- Water is used at some point in the process of generating and harnessing every form of energy. The amount of water consumed during energy production varies by type and by the part of the process it is used in. (Source: Boston University)

Climate Change

Climate change is damaging energy infrastructure and making it harder to produce energy today, and will continue to impact energy systems in the future. A growing human population and the goal of reducing global poverty mean more people are potentially relying on energy from fossil fuels. Burning fossil fuels is the primary cause of climate change.

- Burning coal, oil, and gas (fossil fuels) for energy is the cause of about three-quarters of all greenhouse gas emissions globally and is the largest contributor to climate change. (Source: Our World in Data)
- Not only does energy use contribute to climate change, but the effects of climate change can hurt energy systems. (Source: Environmental Protection Agency)
- Neighborhoods surrounding power plants, predominantly low-income communities whose residents are people of color, experience the most negative consequences of energy use. As climate change worsens and puts a higher demand on power plants, negative consequences will continue to rise. (Source: EPA, PowerPlants and Neighboring Communities Map)
- Extreme weather events and temperatures caused by climate change will disrupt energy grids, causing new geographic areas of people living in energy poverty. (Source: MIT)
- There has been an increase in renewable energy use over time, but not at a fast enough rate to reach net-zero emissions and halt climate change. (Source: Sky News)

Government Influence

Governments can sway the future of energy. Policies can be used to incentivize or deter how much energy is used, where the natural resources for energy come from, who has access to energy, and more. These policies can also be used to encourage the continued use of fossil fuels, worsening the environmental damage caused by energy consumption, or to encourage the switch to clean energy.

- Cuts to tax incentives for solar and wind energy make scaling up these forms of renewable energy a challenge. Tariffs, which make supplies more expensive and harder to come by, can have the same effect. (Sources: The Daily Reporter & Center on Global Energy Policy)
- Some argue that countries should focus on replacing fossil fuel infrastructure with renewables, even if they must halt actions that create economic growth during the transition. However, this is not an easy endeavor for any country at any stage of

development. (Source: Resilience)
- Global politics and economic changes influence countries' ability to invest in energy diversification. (Source: Center for Strategic & International Studies)
- Many governments show a preference for fossil fuel use over alternative energy by providing fossil fuel subsidies to keep energy prices low for the consumer. (Source: International Monetary Fund)
- Financial investment in oil and gas continues to rise. And although clean energy investment is rising as well, it is mainly happening in high- and middle-income countries. (Source: Energy Tracker Asia)

Energy Access

The United Nations' Sustainable Development Goal 7 is to "ensure access to affordable, reliable, sustainable, and modern energy for all". Energy access, at the most basic level, means that the option for energy is physically present. The growing human population creates an urgency to provide energy for everyone and to meet SDG 7.

- Globally, there are higher rates of people without energy in rural parts of the world than in urban areas. (Source: United Nations Sustainable Development Group)
- A majority of the global population without access to energy resides in sub-Saharan Africa. On the entire African continent, 600 million people are without energy access, 98% of whom reside in the sub-Saharan region. (Source: Center for Strategic & International Studies)
- In 2022, the rate of global population growth surpassed the ability to create new energy connections, increasing the total number of people lacking access to energy. (Source: International Energy Agency)
- Financial barriers make renewable energy sources even more inaccessible than nonrenewable sources for countries without access to any energy. (Source: Climate Action Network International)
- Global population growth is outpacing the progress being made towards SDG 7, which could leave millions of people without energy by the time the goal year of 2030 arrives. (Source: United Nations)

Energy Poverty

If people live in areas where energy is unaffordable, unreliable, and unstable, they are considered to be living in energy poverty. Energy poverty is difficult to define, as every country and region has different energy needs. As the human population grows, there is more strain put on the energy grid, which can result in a larger percentage of the population living in energy poverty.

- While 733 million people do not have access to any kind of electricity connection for their home, even more people, 1.2 billion in total, have unreliable and/or unaffordable energy. (Source: United Nations Development Programme)
- Bringing energy to places that lack access currently primarily utilizes the burning of fossil fuels, which can cause pollution, climate change, and are costly and inefficient, resulting in energy poverty, as people cannot consistently access this energy. (Source: Rose Mutiso, TED)
- Energy shortages impact a country's economy because it becomes difficult to produce goods, and energy must be outsourced at a high cost from other countries. (Source: Carnegie Endowment for International Peace)
- People without affordable and reliable energy often rely on burning wood, dung, and other biomass. This particularly harms women and children, and puts them at risk of premature death. (Source: Switch Energy Alliance)
- Geographic regions experiencing energy poverty are shifting, as climate change is causing energy-burdened households to now be primarily located in warmer climates as opposed to historically being located in colder regions. (Massachusetts Institute of Technology)

Generating Your Own Subtopic

Coming up with your own subtopic can be intimidating if you don't know where to start. To help, we've created the following list of questions and reminders to help you formulate your own subtopic. Ask yourself these questions, and as you answer them, notice what stands out or find repeating trends in your answers. Those are what you should focus on to generate your subtopic!

Probing questions

1. Have you noticed anything related to this global topic in your community? If so, how does what is happening locally connect to challenges globally?
2. Does this topic connect to an area of interest to you? If so, how does it connect?
3. What does this topic first bring to mind when you think about it? What emotions does this topic make you feel?
4. What do you already know about this topic? What do you want to know?
5. Have you read any books or articles, or listened to podcasts about this topic? If so, what did you learn from them?

Keep in mind that the subtopic you choose should be:

- Connected to human population growth - *how does population growth impact it?*
- Focused on a single problem or issue
- Researchable using primary and/or secondary sources
- Feasible to answer within the timeframe of 60 seconds
- Specific enough to answer thoroughly