

Forum: Environmental Committee (EC)

Issue: The impact of industrial pollution on pandemic transmission

Student Officer: Maya Mathiou-Rose

Position: Co-Chair

INTRODUCTION

The emergence and uncontrollable spread of the novel Coronavirus disease (COVID-19) has created a health crisis for citizens all over the world.¹ The outbreak of the infectious disease caused by the SARS-CoV-2 virus was declared a global pandemic by the World Health Organization (WHO) on March 11th, 2020.² Following multiple industrial revolutions and advances in the industrial sectors in most countries, human exposure to high levels of air pollution has been proven to cause a variety of harmful effects on human health and perpetuate already existing medical conditions. It is important to note that poor air quality as a result of pollution has been reported by numerous public health organizations as a leading environmental threat to human health.

Research has shown that both long- and short-term exposure to air pollutants emitted mainly from factories have been associated with health impacts; the common being an increase for the risk of respiratory infections, lung cancer and heart disease.³ Additionally, poor air quality has been associated with perpetuating already existing health conditions such as asthma, diabetes and obesity. The most common spread of the Covid-19 disease is through airborne transmission, meaning the inhalation of air that carries fine droplets and aerosol particles that contain the infectious virus.

A literary review done by the “Panel for the Future of Science and Technology” of the European Parliamentary Research Service (EPRS) found that higher levels of air pollution and poor air quality, have been associated with higher mortality rates in people suffering from Covid-19. The review also demonstrated a strong correlation between increased deaths from

¹ “Coronavirus.” *World Health Organization*, World Health Organization, https://www.who.int/health-topics/coronavirus#tab=tab_1.

² M.; Cucinotta D; Vanelli. “WHO Declares COVID-19 a Pandemic.” *Acta Bio-Medica : Atenei Parmensis*, U.S. National Library of Medicine, <https://pubmed.ncbi.nlm.nih.gov/32191675/>.

³ “Health Consequences of Air Pollution on Populations.” *World Health Organization*, World Health Organization, www.who.int/news/item/15-11-2019-what-are-health-consequences-of-air-pollution-on-populations.

Covid-19 in areas with high levels of air pollution. And additionally highlighted the adverse effects on the immune system that urban airborne particulate matter and airborne pollutants as well as the inhalation of dust can have. Lungs serve as a major immune organ that carry germs and other foreign bodies such as pollutants.⁴ This effect on the immune system hence leaves humans more vulnerable to death as a result of Covid-19.⁵

DEFINITION OF KEY-TERMS

Covid-19

“A highly contagious respiratory disease caused by the SARS-CoV-2 virus.”⁶

Pandemic

“The spread of disease that exists in almost all of an area or in almost all of a group of people, animals or plants”⁷

Particulate Matter (PM)

“Solid particles and liquid droplets in the air.”⁸

PM 10 (Course Particles)

“Inhalable particles, with diameters that are generally 10 micrometers and smaller.”⁹

PM 2.5 (Fine Particles)

“Tiny particles or droplets in the air that are two- and one-half microns or less in width.”¹⁰

PM 0.1 (Ultrafine Particles)

⁴ “What Else Do the Lungs Do? - British Lung Foundation.” *Asthma + Lung UK*, 26 Feb. 2022, www.blf.org.uk/support-for-you/how-your-lungs-work/what-else-do-the-lungs-do.

⁵ Kumar, Vijay. “Pulmonary Innate Immune Response Determines the Outcome of Inflammation during Pneumonia and Sepsis-Associated Acute Lung Injury.” *Frontiers*, Frontiers, 1 Jan. 2001, [www.frontiersin.org/articles/10.3389/fimmu.2020.01722/full#:~:text=Lungs%20are%20the%20vital%20organs,\)%20\(12%2C%2014\)](http://www.frontiersin.org/articles/10.3389/fimmu.2020.01722/full#:~:text=Lungs%20are%20the%20vital%20organs,)%20(12%2C%2014)).

⁶ “NCI Dictionary of Cancer Terms.” *National Cancer Institute*, www.cancer.gov/publications/dictionaries/cancer-terms/def/covid-19.

⁷ “Pandemic.” *Cambridge Dictionary*, dictionary.cambridge.org/dictionary/english/pandemic.

⁸ “SCDHEC.” *What Is Particulate Matter?*, scdhec.gov/environment/your-air/most-common-air-pollutants/particulate-matter/what-particulate-matter.

⁹ EPA, Environmental Protection Agency, www.epa.gov/air-trends/particulate-matter-pm10-trends.

¹⁰ “Department of Health.” Fine Particles (PM 2.5) Questions and Answers, www.health.ny.gov/environmental/indoors/air/pmq_a.htm#:~:text=The%20term%20fine%20particles%2C%20or,25%2C000%20microns%20in%20an%20inch.

“Particulate matter with an aerodynamic diameter of up to 0.1 μm ”¹¹

Pollution

“The introduction of harmful materials into the environment.”¹²

Pollutant

“A substance that is present in concentrations that may harm organisms (humans, plants and animals) or exceed an environmental quality standard”¹³

BACKGROUND INFORMATION

The History of Industrialization

What was the Industrial Revolution?

The Industrial Revolution began in Great Britain in the mid-late 18th Century, around 1760, and lasted until sometime between 1820 and 1840 in the early 19th Century.¹⁴ Most historians claim the root cause of the Industrial Revolution to be the emergence of capitalism as well as European imperialism and the need to mine coal. This transcontinental revolution allowed for the existing agricultural societies to transition into more industrialized and urban societies that used new manufacturing processes.¹⁵

The revolution paved the way for our modernized world with its new machines, new power sources and new ways to organize work that required manual human labor in existing industries making them more productive, efficient, and less labor-intensive for workers. Through the revolution, economies that had been based on farming and agriculture were transformed into economies based on large-scale manufacturing and the factory system.¹⁶

Additionally, the Industrial Revolution created an increase in employment opportunities as factories became increasingly more popular and widespread, more employees were needed

¹¹Glossary: PM, www.greenfacts.org/glossary/pqrs/PM10-PM2.5-PM0.1.htm.

¹²“Pollution.” *National Geographic Society*, education.nationalgeographic.org/resource/pollution.

¹³ Directorate, OECD Statistics. *OECD Glossary of Statistical Terms - Pollutant Definition*, stats.oecd.org/glossary/detail.asp?ID=2073.

¹⁴“Industrial Revolution.” *Encyclopædia Britannica*, Encyclopædia Britannica, Inc., www.britannica.com/event/Industrial-Revolution.

¹⁵“Industrial Revolution.” *History.com*, A&E Television Networks, 21 Aug. 2018, www.history.com/topics/industrial-revolution.

¹⁶“Industrial Revolution.” *Encyclopædia Britannica*, Encyclopædia Britannica, Inc., www.britannica.com/event/Industrial-Revolution.

to operate the heavy machinery which led to an increase in the supply of jobs at factories that paid higher wages than what individuals were making as farmers.¹⁷

What were the consequences of the Industrial Revolution?

Although the Industrial Revolution permanently changed society in many positive ways by bringing rapid urbanization, the movement of people into cities and economic growth there was a growing factor that seemed to follow society like a shadow through history from then until today. The growth of factories and the demand for raw materials caused a significant amount of pollution.¹⁸ Pollution became an increasing concern because the creation of factories as well as their functioning was powered by burning coal, and hence, all the big industrial cities began pumping large quantities of pollutants into the atmosphere.

These pollutants included large amounts of chemicals, smoke, and carbon monoxide-filled clouds of dust that began posing major health risks such as lung cancer and respiratory diseases on citizens that chose to live in urban centers that were highly populated by factories.¹⁹ As factories continued to grow and increase in numbers, air pollution continued to rise in the 1800's. This began to cause and perpetuate respiratory illnesses which consequently led to higher death rates in areas that burned more coal.²⁰

¹⁷ Chen, James. "How the Industrial Revolution Changed Business and Society." *Investopedia*, Investopedia, 8 July 2022, www.investopedia.com/terms/i/industrial-revolution.asp.

¹⁸ Kiger, Patrick J. "7 Negative Effects of the Industrial Revolution." *History.com*, A&E Television Networks, 9 Nov. 2021, www.history.com/news/industrial-revolution-negative-effects#:~:text=The%20Industrial%20Revolution%20was%20powered,Our%20World%20In%20Data%20illustrates.

¹⁹ *Industrial Revolution Impacts on the Environment*. study.com/academy/lesson/the-industrial-revolution-impacts-on-the-environment.html.

²⁰ Ibid, 18

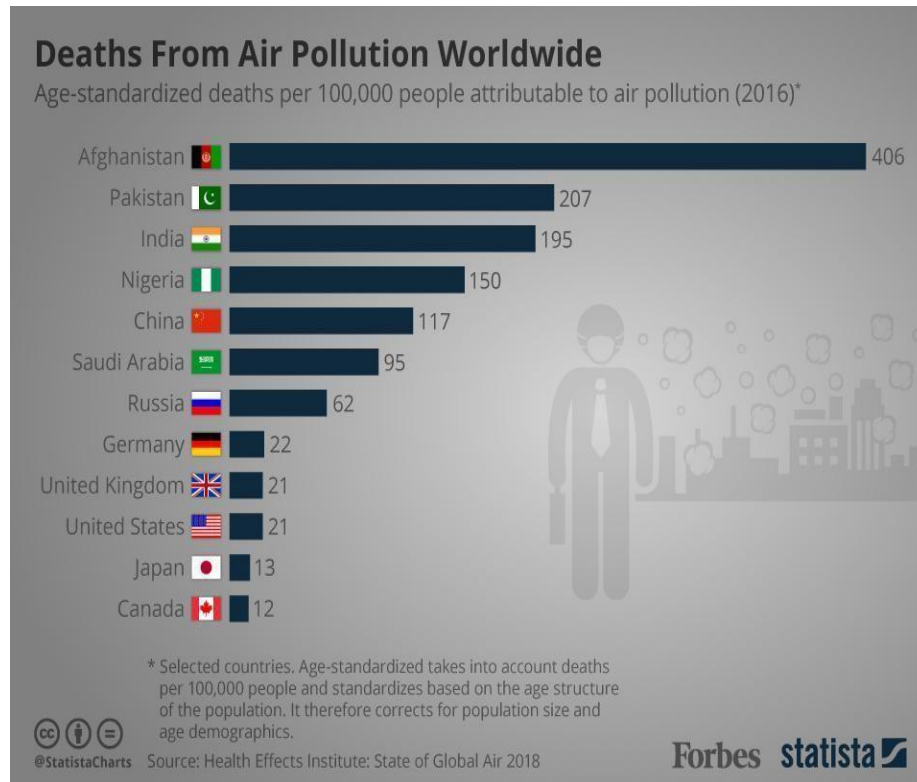


Figure 1: “Deaths from Air Pollution Worldwide”²¹

The History of Pandemics

Along with the spread of humans on a global scale, followed the spread of infectious diseases. What is considered our mortal flaw as a modern civilization is the fact that disease and illnesses have plagued humanity since the earliest times. Even in our modern society, small and large-scale outbreaks seem to be a constant occurrence. As a result of industrialization from the Industrial Revolution, widespread trade on a global scale became increasingly popular. It has also been seen throughout history that the urbanization of the developing world has brought more rural residents into denser, urban neighborhoods, putting a larger strain on the environment.

As air traffic has almost doubled in the last decade or so, the macro-trends of population increase and higher pressure on the environment are beginning to have a more evident impact

²¹ McCarthy, Niall, and Felix Richter. “Infographic: Deaths from Air Pollution Worldwide.” Statista Infographics, 19 Apr. 2018, www.statista.com/chart/13575/deaths-from-air-pollution-worldwide/.

on the spread of multiple infectious diseases.²² It is also important to note that a pandemic is defined as the worldwide spread of a new disease.²³ All pandemics pose large threats to humanity resulting in large death tolls and massive gaps in society.

As trade became more popular and humans became more civilized, cities became larger, more exotic trade routes were discovered and most importantly there was an increased contact of people from different populations, contact of animals and ecosystems with humans; making pandemics more likely to occur. This is because these contacts created multiple new opportunities for humans to make more common existing interactions with animals as well as new ones.

These interactions became the cause of the well-known Spanish Flu (1918-1919) that killed an estimated 40-50 million people and was contracted from pigs, the global pandemic of HIV/AIDS (1981-present) that killed an estimated 25-35 million people and was contracted from chimpanzees and lastly and most recently, the Covid- 19 Pandemic which has killed an estimated 6.5 million people from 2019 to today.²⁴

The Covid-19 Pandemic and Pollution

The relationship between the Covid-19 Pandemic and Pollution has long been seen as bi-directionally ambiguous. This is because pollution has had an effect on the pandemic but, the pandemic has also had an effect on pollution. The most common effect of air pollution on Covid-19, is that the cause of health problems such as diabetes, high blood pressure, lung cancer and respiratory illnesses increases the chances of death from Covid-19 infection. A study led by Xiao Wu and Rachel Nethery called the “Harvard Chan”²⁵ study, found a correlation between longitudinal air pollution and an 11% increase in mortality as a result of Covid-19 infection for every 1 microgram/cubic meter increase in air pollution.²⁶ It is important to note that even though there have been many studies investigating the effect of air pollution on an

²² Nicholas LePan Graphics/Design: . “Visualizing the History of Pandemics.” *Visual Capitalist*, 8 July 2022, www.visualcapitalist.com/history-of-pandemics-deadliest/.

²³ “What Is a Pandemic?” *Healthdirect*, www.healthdirect.gov.au/what-is-a-pandemic.

²⁴ “Coronavirus Death Toll.” *Worldometer*, www.worldometers.info/coronavirus/coronavirus-death-toll/.

²⁵ “Coronavirus and Air Pollution.” *C-CHANGE | Harvard T.H. Chan School of Public Health*, 17 May 2022, www.hsph.harvard.edu/c-change/subtopics/coronavirus-and-pollution/.

²⁶ *Ibid*, 25

individual's likelihood of dying from Covid-19, researchers cannot state that air pollution directly affects mortality as a result of Covid-19 infection or higher risk of transmission of the disease as a result of greater air pollution. However, the studies do overall show a repetitive trend that depicts an association between long-term exposure to pollutants and general air pollution with higher Covid-19 mortality rates.²⁷

COVID-19 death toll compared to other pandemics		
PANDEMIC	DATES	DEATH TOLL
 Smallpox	~3,000 years–1979 ^A	>300,000,000 ^B
 Black Death	1347–1351	~225,000,000 ^C
 Spanish Flu (H1N1)	1918–1919	50,000,000
 HIV/AIDS	1981–Present	23,600,000–43,800,000
 Cholera	1899–1923 ^D	>1,500,000
 Asian Flu (H2N2)	1957–1958	1,100,000
 Russian Flu (likely H2N2)	1889–1890	1,000,000
 Hong Kong Flu (H3N2)	1968–1970	1,000,000
 Swine Flu (H1N1)	2009–2010	151,700–575,400
 COVID-19	2019–Present	333,489 ^E
 Ebola	2014–2016	11,300
 MERS	2012–Present	866
 SARS	2002–2003	774

Figure 2: “The COVID-19 Death toll compared to other pandemics”²⁸

²⁷ “Coronavirus and Air Pollution.” *C-CHANGE* | Harvard T.H. Chan School of Public Health, 17 May 2022, www.hsph.harvard.edu/c-change/subtopics/coronavirus-and-pollution/.

²⁸ Nicholas LePan Graphics/Design: . “Visualizing the History of Pandemics.” *Visual Capitalist*, 8 July 2022, www.visualcapitalist.com/history-of-pandemics-deadliest/.

The figure above effectively depicts the scale of the death toll of pandemics over time by ranking them from highest to lowest and identifying the number of deaths for each pandemic.

MAJOR COUNTRIES AND ORGANIZATIONS INVOLVED

China

China is the world's leading manufacturing industry. Beijing's air pollution is seven times higher than the World Health Organization's standard for healthy air quality.²⁹ The rapid development of the manufacturing industry in China has led to increasing consumption of resources and the destruction of the environment on a global scale. Almost one-third of the global energy consumption as well as 36% of CO₂ emissions can be attributed to China's manufacturing industry.³⁰ It is important to mention that an estimated 1.24 million people died from exposure to air pollution in 2017 in China.

Prior to this, China had launched a campaign in 2013 to tackle smog and poor air quality as a result of pollution and since then air quality has improved to a notable extent. The average concentration of fine hazardous airborne particles, namely PM 2.5, decreased from 60 micrograms per cubic meter in 2015 to 30 micrograms per cubic meter in 2021, leaving the concentration at about half of what it used to be.³¹ Additionally, the Chinese government has made multiple efforts to temporarily shut down tens of thousands of factories in an effort to improve overall air quality in the highly industrial regions of China.³²

Bangladesh

The air pollution levels and air quality in Bangladesh are considered the worst in the world, reducing the average Bangladeshi citizen's life expectancy by 6.7 years.³³ Overall, in Bangladesh the main causes of pollution are emissions from vehicles, fumes from factories and

²⁹ "From 'Airpocalypse' to Olympic Blue: China's Air Quality Transformation." *EPIC*, 22 Feb. 2022, epic.uchicago.edu/news/from-airpocalypse-to-olympic-blue-chinas-air-quality-transformation/.

³⁰ Wang, Hongyang, and Baizhou Li. "Environmental Regulations, Capacity Utilization, and High-Quality Development of Manufacturing: An Analysis Based on Chinese Provincial Panel Data." *Nature News*, Nature Publishing Group, 1 Oct. 2021, www.nature.com/articles/s41598-021-98787-y.

³¹ Person. "China Must Raise Air Quality Standards as Smog Persists, Task Force Says." *Reuters*, Thomson Reuters, 23 Apr. 2022, www.reuters.com/world/china/china-must-raise-air-quality-standards-smog-persists-task-force-2022

³² "China Shuts down Thousands of Factories to Battle Pollution." *Global Citizen*, www.globalcitizen.org/de/content/china-factory-shut-down-pollution-air/#:~:text=China

³³ "World's Worst Air Pollution Slashes 7 Years off Life Expectancy in Bangladesh." *Mongabay Environmental News*, 16 June 2022, news.mongabay.com/2022/06/worlds-worst-air-pollution-slashes-7-years-off-life-expectancy-in-bangladesh/#:~:text=Air%20pollution%20in%20Bangladesh%20is,Dhaka%2C%20from%202005%20to%202018.

brick kilns and dust accumulations ranging from a variety of sources.³⁴ In general, both outdoor and indoor air pollution alone causes about 21% of all deaths in Bangladesh.³⁵ In 2021, Bangladesh ranked first in terms of air pollution globally, putting citizens at risk of lung disease, cancer, respiratory issues and other lethal health conditions.

Nepal

Nepal has consistently ranked in the top 10 of the most polluted countries of the world over the last few decades.³⁶ In 2019, the State of Global Air report placed Nepal among the top 10 countries with the highest levels of outdoor PM 2.5.³⁷ Additionally, Nepal contributes an annual average emission of 83.1 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) of PM 2.5 in the country. The most common contributing factors to poor air quality in Nepal include mainly factories from manufacturing and construction industries, followed closely by vehicle emissions, road dust and waste burning. In Nepal, air pollution occasionally manages to slice as many as 4 years of citizens' life expectancy.

United Kingdom

In the United Kingdom a leading major cause for diseases such as asthma, lung disease and heart disease, is air pollution. It has been estimated to cause around 40,000 premature deaths per year which accounts for roughly 8.3% of all deaths while costing the UK government around 40 billion pounds (£40B), each year. Most of the air pollution in the United Kingdom comes from road transport and residential emissions.

Environmental Protection Agency (EPA)

The Environmental Protection Agency (EPA) was founded on the 2nd of December 1970 in the United States of America and is responsible for the general protection of human health

³⁴ "Bangladesh Air Quality Index (AQI) and Air Pollution Information." IQAir, www.iqair.com/us/bangladesh.

³⁵ World Bank Group. "Clean and Resilient Growth in Bangladesh." *World Bank*, World Bank Group, 17 Sept. 2018, www.worldbank.org/en/news/feature/2018/09/16/clean-and-resilient-growth-in-bangladesh.

³⁶ "Air Pollution Linked with Higher COVID-19 Death Rates." *News*, 5 May 2020, www.hsph.harvard.edu/news/hsph-in-the-news/air-pollution-linked-with-higher-covid-19-death-rates/.

³⁷ "One More Report Ranks Nepal among Most Polluted Countries in the World." *The Kathmandu Post*, The Kathmandu Post, kathmandupost.com/climate-environment/2020/10/21/one-more-report-ranks-nepal-among-most-polluted-countries-in-the-world#:~:text=As%20the%20country%20braces%20for,5%20levels%20in%202019.

and the environment.³⁸ Additionally, the EPA sponsors and conducts research on leading environmental threats and develops and enforces environmental regulations.³⁹ The EPA also has the right to set limits on dangerous air pollutants from factories, refineries, power plants, oil and gas extraction, and vehicles with high emissions.⁴⁰

United Nations Environment Programme (UNEP)

Founded on the 5th of June 1972 in Nairobi Kenya, “The United Nations Environment Programme (UNEP) is the leading environmental authority in the United Nations system.”⁴¹ The main goal of the UNEP is to strengthen environmental standards all over the world, while simultaneously putting into practice and helping implement environmental obligations at the country, regional and global levels.

International Union of Air Pollution Prevention and Environmental Protection Associations (IUAPPA)

The IUAPPA was founded in 1964 by Dr. Christopher Bartel in the United States of America. With a total of 40 national organizations, it “promotes the World Clean Air Congress and regional meetings, supports technical and policy development, and leads international initiatives such as the Global Atmospheric Pollution Forum and contributes to initiatives such as the Climate and Clean Air Coalition.”⁴²

TIMELINE OF EVENTS

DATE	DESCRIPTION OF EVENT
1760 – 1820/40	The Industrial Revolution takes place.
1947	The first air pollution control district is established.
1963	The Clean Air Act was created.
1964	IUAPPA was formed.

³⁸ “Environmental Protection Agency.” *USAGov*, www.usa.gov/federal-agencies/environmental-protection-agency.

³⁹ *EPA*, Environmental Protection Agency, www.epa.gov/.

⁴⁰ “Environmental Protection Agency Definition & Meaning.” *Merriam-Webster*, Merriam-Webster, www.merriam-webster.com/legal/Environmental%20Protection%20Agency.

⁴¹ “UNEP : United Nations Environment Programme – Office of the Secretary-General's Envoy on Youth.” *United Nations*, United Nations, www.un.org/youthenvoy/2013/08/unep-united-nations-environment-programme/.

⁴² *IUAPPA*, www.iuappa.org/.

2 nd December, 1970	The Environmental Protection Agency (EPA) is created.
5 th June, 1972	The United Nations Environment Programme was founded.
11 th December, 1997	The Kyoto Protocol is signed.
16 th February, 2005	The Kyoto Protocols becomes effective.
21 st December, 2012	The Kyoto Protocol expires.
1 st January, 2016	The UN Sustainable Development Goals are fully implemented.
22 nd April, 2016	The Paris Agreement is signed.
2020 – 2021	NASA observes that the Earth's atmosphere has seen significant reductions in air pollutants since the strict global COVID-19 quarantines.
March 11 th , 2020	The World Health Organization (WHO) declared the novel coronavirus (COVID-19) outbreak a global pandemic
December 11 th , 2020	The FDA grants Pfizer-BioNTech the first Emergency Use Authorization (EUA) for an mRNA vaccine, a new type of vaccine that had proven to be highly effective against COVID-19.
12 th May, 2021	The European Commission adopted the EU Action Plan: "Towards a Zero Pollution for Air, Water and Soil"

RELEVANT UN RESOLUTIONS, TREATIES AND EVENTS

United Nations Framework Convention on Climate Change (1992)⁴³

The international UNFCCC treaty with 165 signatories aimed to set an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. "It recognizes that the climate system is a shared resource whose stability can be affected by industrial and other emissions of carbon dioxide and other greenhouse gases."

⁴³ *Unfccc.int, unfccc.int/.*

Geneva Convention on Long-range Transboundary Air Pollution (CLRTAP)(1979) and its protocols⁴⁴

The common framework for transboundary cooperation on Air Pollution was put into effect in 1983. It laid down the general principles of international cooperation for air pollution reduction as well as setting up an institutional framework which has since brought together research and policy.

PREVIOUS ATTEMPTS TO SOLVE THE ISSUE

The Paris Agreement

The international treaty on climate change known as “The Paris Agreement” or the “Paris Climate Accords”, was the first-ever universal, legally binding global climate change agreement adopted in 2015 and covered the pressing matter of climate change mitigation. The agreement set out a globally-scaled framework with the goal of avoiding dangerous climate change. The framework included limiting global warming to below 2°C while pursuing efforts to keep it to 1.5°C. Although it focuses on avoiding the effects of dangerous climate change, it also aims to strengthen each country’s ability to combat the undeniable impacts of climate change and support each country in their efforts to do so.⁴⁵ However, up to date many believe that the Paris Agreement is failing as countries including Australia, Brazil, Indonesia, Mexico, New Zealand, Singapore, Switzerland, and Vietnam have been deemed “highly insufficient” in reaching their goals seven years after signing the Agreement in 2015.⁴⁶

The Kyoto Protocol

The Kyoto Protocol was an international treaty that was operationalized with the United Nations Framework Convention on Climate Change that committed industrialized state parties and economies in transition to reduce greenhouse gas gases (GHG) emissions in accordance with

⁴⁴ “International Cooperation on Air Pollution.” *UNECE*, unece.org/ar/node/364778.

⁴⁵ “Paris Agreement.” *Climate Action*, ec.europa.eu/clima/eu-action/international-action-climate-change/climate-negotiations/paris-agreement_en.

⁴⁶ “Every G20 Country Is Failing to Meet Paris Agreement on Climate Change.” *Earth.Org*, 27 Jan. 2022, earth.org/every-g20-country-is-failing-to-meet-paris-agreement-on-climate-change/.

the previously agreed individual targets of each member state.⁴⁷ It was based on a global scientific consensus that global warming is occurring and increasing at an alarming rate; and that human-made carbon dioxide (CO₂) emissions are a leading factor in it. Overall, between the years 1990 and 2012, the original Kyoto Protocol parties were able to reduce their Carbon Dioxide (CO₂) emissions by 12.5%, which was well beyond the 2012 target of 4.7%. Therefore, the Kyoto Protocol was considered a huge success.⁴⁸

Sustainable Development Goals (SDGs)

“The 2030 Agenda for Sustainable Development is a set of international development goals from 2016 to 2030, which was adopted by the UN Sustainable Development Summit held in September of 2015 which focused on building on the success of the Millennium Development Goals (MDGs).”⁴⁹ Overall, the agenda consisted of a total of 17 goals and 169 total targets that focused on universal goals that were applicable to both developed and developing countries. The following Sustainable Development Goal targets are relevant to air pollution:

SDG target 3.9.1: This target calls for a substantial reduction in deaths and illnesses from air pollution.⁵⁰

SDG target 7.1.2: This target aims to ensure access to clean energy in homes.⁵¹

SDG target 11.6.2: This target aims to reduce the environmental impact of cities by improving air quality.⁵²

⁴⁷ “Dec 11, 1997 CE: Kyoto Protocol Signed.” *National Geographic Society*, education.nationalgeographic.org/resource/kyoto-protocol-signed.

⁴⁸ Tardi, Carla. “The Kyoto Protocol.” *Investopedia*, Investopedia, 10 Mar. 2022, www.investopedia.com/terms/k/kyoto.asp.

⁴⁹ “What Is the Sdgs? | Japan Sdgs Action Platform.” *Ministry of Foreign Affairs of Japan*, www.mofa.go.jp/policy/oda/sdgs/index.html.

⁵⁰ Ibid, 49

⁵¹ Ibid, 49

⁵² Ibid, 49

POSSIBLE SOLUTIONS

Take action against Coal and Fossil Fuel usage

Pollution from burning any and all types of fossil fuels is harmful to the environment and atmosphere. The burning of coal however, has an even larger impact on air pollution than burning oil or gas because it releases more carbon dioxide, sulfur dioxide, and heavy metal pollutants per unit of energy than fossil fuels do. Coal plants should start being replaced by natural gas and in that way, there can be a global increase in electricity supplied by clean, renewable sources like wind, solar, and water.

Place Emphasis on Clean Energy Resources

Use of Clean energy technologies like solar, wind and geothermal is on the rise these days. Governments around the world need to enforce new legislation and frameworks that provide grants to citizens who are interested in installing solar panels for their homes.

Lessen the impact of Vehicle Emissions

Cars and vehicles create exhaust full of carbon dioxide, nitrogen dioxide, and other pollutants. Driving less, in favor of public transportation, biking, or walking, helps decrease air pollution. Also, using cars with increased fuel efficiency or electric cars that do not rely on fossil fuels can decrease the amount of pollution we are contributing to the atmosphere.

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[www.globalcitizen.org/de/content/china-factory-shut-down-pollution-air/#:~:text=China%](http://www.globalcitizen.org/de/content/china-factory-shut-down-pollution-air/#:~:text=China%20)

20might%20be%20on%20the,new%20approach%20to%20pollution%20management.&tex=In%20an%20unprecedented%20crackdown%20on,industrial%20regions%20in%20the%20country.

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