Committee: Environmental Commission

Issue: Monitoring and mitigating methane emissions in megacities

Student Officer: John Roy Amurao

Position: President

PERSONAL INTRODUCTION

Dear Delegates,

My name is John Roy Amurao; it will be my utmost honour to serve as the President of the Environmental Commission in the upcoming ACGMUN 2022 Conference. I am currently an IGCSE student attending Byron College – The British International School of Athens.

Personally, Model UN has blossomed into more than just another superficial extracurricular activity, it has grown to become a community of friendships, knowledge, and thought-provoking debates. Throughout this conference, I wish to be able to emulate the same passion and fondness I have for MUN because the memories which I have created in these times are ones that I will cherish forever.

This year's agenda stems from the UN's Eighth Sustainable Development Goal, Decent Work and Economic Growth. Socio-economic instability, a climate crisis, a global pandemic, and human rights violations; without a doubt, the past two years have put us through a severe state of adversity, precariousness, and apprehension. Economic and financial growth is fundamental in taking a step in the right direction to rectify the aforementioned.

In this study guide, you will be presented with a solid foundation to start off your research into this intriguing yet alarming topic. Needless to say, further research is paramount and needs to be conducted as the information you will find is untailored to your own delegation but rather generalised facts. Should you have any inquiries, please feel free to contact me through my email. I am delighted to be part of the 5th ACGMUN conference this year, and I cannot wait to meet you all then.

Best of Luck,

John Roy Amurao – j.amurao@pupils.byroncollege.gr

TOPIC INTRODUCTION

"We are the first generation to feel the effect of climate change and the last generation who can do something about it." – Barack Obama

Quotes like these envelop the global news; arguably, climate change is the most articulated topic at present. The demographic development of nations is the key to socio-economic maturation, consequently leading to the eradication of poverty, starvation, and conflict. Nevertheless, there is a price to pay. Industrialisation and evolution always required factories, infrastructure, and transportation which play a substantial role in advancing societies and the world. Due to this, greenhouse gases have become prevalent in our innermost atmosphere leading to catastrophic consequences. Methane is the most abundant greenhouse gas emitted after Carbon Dioxide accounting for approximately 25% of global greenhouse gases (GHGs)[1]. Despite its significantly lower concentration, experts estimate CH4 (Methane) to be 80 times more potent than CO2 (Carbon Dioxide), meaning a higher ability in trapping heat[2]. Methane is released into the atmosphere in several ways, both anthropogenically and naturally. CH4 is released through the process of coal, natural gas, and oil production/transportation, as well as landfills and agricultural causes regarding livestock and ecological land management. Additionally, the biological decay of organic waste leads to the release of the aforementioned gas.

Urbanisation has led to the creation of 'Megacities' in which extensive levels of methane emissions are being emitted from. The recent COP26[3] conference has emphatically stressed the importance of needed measures to annihilate any and all central contributors to the increase of global temperatures. The prominent legislation signed was concerning methane emission; the monitoring of methane emissions in megacities is fundamental in mitigating the climate crisis we find ourselves in.

[1] United States Environmental Protection Agency. "Overview of Greenhouse Gases." US EPA, united states environmental protection agency, 31 Oct. 2018, www.epa.gov/ghgemissions/overview-greenhouse-gases. Accessed 16 Feb. 2022.
[2] US EPA, OAR. "Importance of Methane." Www.epa.gov, 11 Jan. 2016, www.epa.gov/gmi/importance-methane. Accessed 16 Feb. 2022.
[3] "COP26: US and EU Announce Global Pledge to Slash Methane." BBC News, BBC, 2 Nov. 2021, https://www.bbc.com/news/world-59137828. Accessed 16 Feb. 2022.

DEFINITION OF KEY TERMS

Emissions

"An amount of a substance that is produced and sent out into the air that is harmful to the environment, especially carbon dioxide"[4]

Megacity

"A very large city, typically one with a population of over ten million people"[5]

Demographic Development

"The gradual pattern of change in the growth of human populations in a particular region or country, from a rapid increase in the birth and death rates to a levelling off in the growth rate due to reduced fertility and other factors."[6]

Industrialisation

"The development of industries in a country or region on a wide scale."[7]

Greenhouse Gas

"A gas that contributes to the greenhouse effect by absorbing infrared radiation. Carbon dioxide and chlorofluorocarbons are examples of greenhouse gases."[8]

Ground Level Ozone

"Ground-level ozone forms just above the earth's surface (up to about 2 miles above ground) and impacts human, animal, and plant respiration. Although ground-level ozone is less concentrated than stratospheric ozone, its impacts on human health and welfare make ground-level ozone "bad ozone."[9]

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[4] "Emission." Dictionary.cambridge.org, dictionary.cambridge.org/dictionary/english/emission. Accessed 16 Feb. 2022.
[5] "Megacity | Definition of Megacity by Oxford Dictionary on Lexico.com Also Meaning of Megacity." Lexico Dictionaries | English, www.lexico.com/definition/megacity. Accessed 16 Feb. 2022.
[6] "Demographic Development." Www.eionet.europa.eu, www.eionet.europa.eu/gemet/en/concept/2055 . Accessed 16 Feb. 2022.
[7] "INDUSTRIALIZATION | Meaning & Definition for UK English | Lexico.com." Lexico Dictionaries | English, www.lexico.com/definition/industrialization. Accessed 16 Feb. 2022.
[8] "Greenhouse Gas | Definition of Greenhouse Gas by Oxford Dictionary on Lexico.com Also Meaning of Greenhouse Gas." Lexico Dictionaries | English, www.lexico.com/definition/greenhouse_gas.
[9] Governments, Capital Area Council of. "What Is Ground-Level Ozone?" Air Central Texas, aircentraltexas.org/en/regional-air-quality/what-is-ground-level-ozone.

Agricultural Sector

"The agriculture sectors comprise establishments primarily engaged in growing crops, raising animals, and harvesting fish and other animals from a farm, ranch, or their natural habitats."[10]

BACKGROUND INFORMATION

Being the second most abundant greenhouse gas in the atmosphere, it is essential that we understand the root source of the chemical compound, known as Methane. The proliferation in methane numbers started approximately 40 years ago, in the 1980s. Evident in numerous studies conducted by climate scientists as well the United Nations Environment Programme (UNEP) and the Climate and Clean Air Coalition, which state that reducing methane-related activities in sectors such as agriculture, may put us in the goldilocks conditions to eradicate the predicament of climate change. Despite the fact that carbon dioxide is the most abundant gas, methane is liable for the formation of an atmospheric layer known as the ground-level ozone. This gaseous layer has proven to be detrimental, both to the environment as well as to humans, equating to 1 million premature deaths annually. [11] Some argue that CO2 is not a greenhouse gas, but rather its high concentrations make it classify as such, hence the need to reduce carbon dioxide emissions but mitigate and phase out methane discharge. Experts believe that "human-caused methane emissions could be reduced by as much as 45 per cent within the decade." Consequently, recalibrating treaties such as the Paris Agreement and intercepting the upsurge of global temperatures and irregular heat distribution.

Sources of Methane release in the atmosphere

To be able to conduct any effective, long-lasting, or sufficient advancement concerning the monitoring and mitigating of methane emissions, the first crucial step that needs to be taken is the proper recognition of its origin. So, where does it come from?

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[10] US EPA, OMS. "Agriculture Sectors: Crop (NAICS 111) and Animal (NAICS 112)." US EPA, 22 Feb. 2013, www.epa.gov/regulatory-information-sector/agriculture-sectors-crop-naics-111-and-animal-naics-112.

[11] United, Nations. "Methane Emissions Are Driving Climate Change. Here's How to Reduce Them." UNEP, 20 Aug. 2021, www.unep.org/news-and-stories/story/methane-emissions-are-driving-climate-change-heres-how-reduce-them. Accessed 16 Feb. 2022.

This highly absorbent and potent gas is a result of both naturally occurring phenomena such as animal digestion and wetlands, as well anthropogenic factors including thermogenic sources. This means the production and transportation of natural gas, agricultural practices, landfills, and more compose the methane in our atmosphere.

A central, troubling source is oil and gas production sites. Fugitive numbers have been recorded, not just from their usual combustion, but also unregulated factories which have led to untreated leaks. Megacities house over 10 million residents, which require heat, food, and energy. [12] At our current unsustainable status, we are unable to produce any of the three to provide us with adequate levels, hence why the burning of fossil fuels is required. It is imperative that levels are constantly monitored, and legislations and bills, which have been passed, are followed through. Even though megacities do not directly produce the majority of methane emissions, the reason for such a large amount of emission release is to supply the needs of the populous city for heating, food etc..

Consequences

Undoubtedly, methane affects any and all biodiversity due to its extreme heat absorption qualities and consequent global warming effects. This consists of two main branches, ecological and environmental consequences, and human-related impacts.

Environmental

Besides the aforementioned consequences of global warming and unequal heat distributions, methane emissions have a far more extensive scale effect than the current, zoomed-in canvas. Ground-level ozone has proven itself to be destructive to general ecosystems, habitats, and crops, with over 26 million affected agrarian products alone.[13] The fluctuating temperatures have resulted in ecosystem disruption since many species are unable to adapt to harsh conditions at such a rapid pace. There has been a direct influence on

[12] Fellows, University of Houston Energy. “Methane Is a Powerful Greenhouse Gas, but Where Does It Come From?” Forbes, 29 Sept. 2017, www.forbes.com/sites/uhenergy/2017/09/29/methane-is-a-powerful-greenhouse-gas-but-where-does-it-come-from/?sh=6c6918d45912.
[13] “Why Is Methane Bad?” Www.honeywell.com, www.honeywell.com/us/en/news/2021/11/methane-what-is-it-and-why-is-it-bad.

food chains and webs, seeing that the amelioration of certain animals has affected food competition.[14] [15]

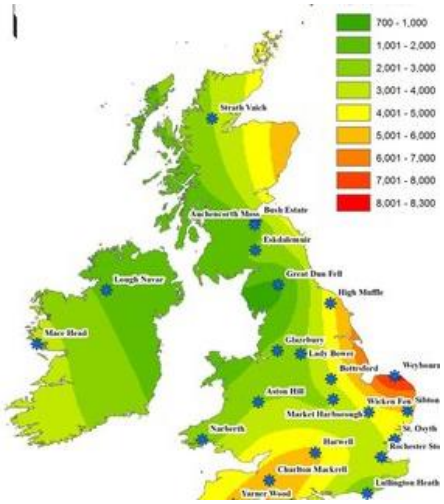
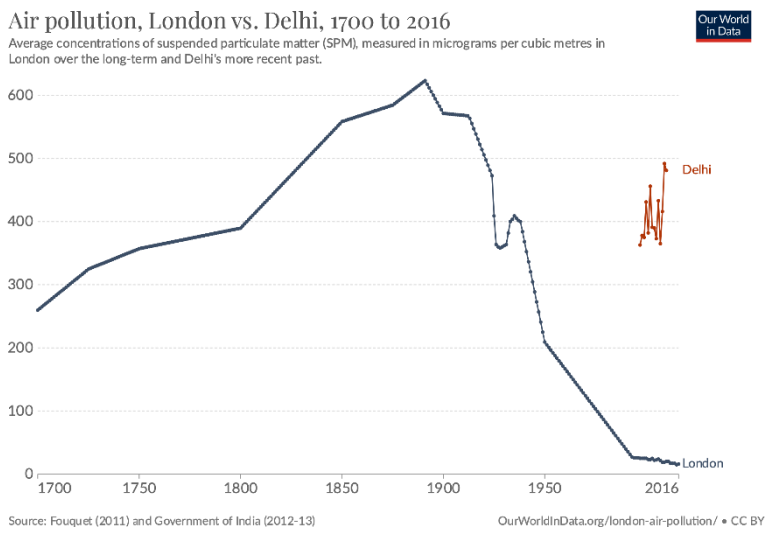


Figure 1: The levels of ground level ozone affecting major areas of the English agricultural crops

Human-Related

It has been witnessed that air quality in megacities has dramatically plunged. Several governments have released official statements outlining precautions needed to be taken and general knowledge regarding methane. The United Kingdom's (UK) Public Health Department states: "High levels of methane can reduce the amount of oxygen inhaled from the air. This can result in mood changes, slurred speech, vision problems, memory loss, nausea, vomiting, facial flushing and headache."[16] The effects of methane have both physiological and psychological implications. In the farthermost cases, high concentrations of methane in one's surroundings can lead to lethal methane gas poisoning. Indirectly speaking, when oil and coal are combusted, it allows for the production of heat, food and energy, as well as methane emissions. Governments must ensure levels of methane and air quality remains appropriate to evade any exposure.[17]

[14] "How Does Climate Change Affect Biodiversity? | Royal Society." Royalsociety.org, www.royalsociety.org/topics-policy/projects/biodiversity/climate-change-and-biodiversity/.
[15] Munir, Said. "ASSESSING the IMPACT of GROUND LEVEL OZONE on AGRICULTURAL CROPS in the UNITED KINGDOM." Reaserach Gate, Sept. 2016, www.researchgate.net/publication/308893225_ASSESSING_THE_IMPACT_OF_GROUND_LEVEL_OZONE_ON_AGRICULTURAL_CROPS_IN_THE_UNITED_KINGDOM.
[16] UK, Public Health Office. "Methane General Information Key Points."
[17] NevadaNano. "The Critical Dangers of Methane Gas Poisoning and Exposure." NevadaNano, 2020, www.nevadanano.com/methane-gas-poisoning-and-exposure/.



[18]

Figure 2: Graph portraying London's decreasing air quality from 1700-2016 in addition to the recent reading of Delhi

Insufficient Actions

Due to the fact that economic stability has been prioritised over environmental equilibrium, the mitigating of methane emissions has been frowned upon for decades. Until recently, the issue was not recognised hence the lack of effective actions. This is because the fossil fuel industry provided countless investors with a plethora of profit and turning a blind eye was the only way of continuing this flow of cash. Before the Paris Conference, many simply decided to publicly state that climate change was a false narrative, meaning no action had to be taken. Since the economic benefit coming from oil production and agribusiness was and continues to be immense, moving away from such resources will be demanding. The solution lies in phasing out such sources of energy and investing in renewable and sustainable forms, mitigating methane.

MAJOR COUNTRIES AND ORGANIZATIONS INVOLVED

China

China is the leading country when it comes to the emission of methane. Approximately 95% of emissions[19] derive from coal power plants scattered across the country. Many governments question China's ability to contain and mitigate the issue at hand which

[18] "What the History of London's Air Pollution Can Tell Us about the Future of Today's Growing Megacities." Our World in Data, 2017, ourworldindata.org/london-air-pollution.
[19] "How Will China Control Its Methane Emissions?" China Dialogue, 7 Jan. 2022, chinadialogue.net/en/climate/how-will-china-control-its-methane-emissions/.

roots to their ratification of their climate co-operation plan with the US. In 2014 alone, China released over 55 million tonnes of methane emissions into the atmosphere causing extreme damage to air quality and biodiversity.[20] Currently, China is looking into methane emissions in key industries across the nation, including coal mining, agriculture and petroleum, and publicising a nationwide methane emission control action plan to counteract the existing damage.

United States of America (USA)

Along with China, the United States stands strong when it comes to the release of this potent, yet harmful gas into the atmosphere. However, like other countries, the US has pledged to reduce methane emissions within the century. The Whitehouse has published the Methane Emissions Reduction Action Plan[21]. This calls for numerous adaptations to their existing operations such as the re-evaluation of rules regarding transportation and methane, as well as tackling the predicament of venting and flaring originating from oil and gas operations. Furthermore, it ensures any and all bills passed to mitigate methane emissions are bipartisan in order to be appealing to all. Optimistically, this can compensate and negate the annual 13 million metric tons[22] of emissions being released. The Biden administration[23] proposed and passed bills to limit the discharge of the said potent gas and make changes for a more sustainable future. Seeing that the US is one of the most developed nations, megacities and methane emissions play a substantial role, hence their major involvement in the topic.

[20] "Will China be able to mitigate its carbon and methane emissions?" China Dialogue, chinadialogue.net/en/climate/how-will-china-control-its-methane-emissions/.
[21] White, House. *U.S. METHANE EMISSIONS REDUCTION ACTION PLAN*. Nov. 2021, www.whitehouse.gov/wp-content/uploads/2021/11/US-Methane-Emissions-Reduction-Action-Plan-1.pdf.
[22] EDF. "Methane: A Crucial Opportunity in the Climate Fight." Environmental Defense Fund, 2021, www.edf.org/climate/methane-crucial-opportunity-climate-fight.
[23] Friedman, Lisa. "Biden Administration Moves to Limit Methane, a Potent Greenhouse Gas." The New York Times, 2 Nov. 2021, www.nytimes.com/2021/11/02/climate/biden-methane-climate.html.

Brazil

Historically, since 2004, the annual rate at which deforestation occurs in the Amazon rainforest has increased significantly.[24] Such biomes are essential to creating environmental stability and carbon equilibrium and controlling methane emissions, and the encouragement for further exploitation for mining and agricultural practices should not be tolerated. Despite this, during the recent COP26 conference, Brazil agreed to legislative actions that promise change and development to phase out deforestation by 2030 and shift to carbon neutrality by 2050. [25]

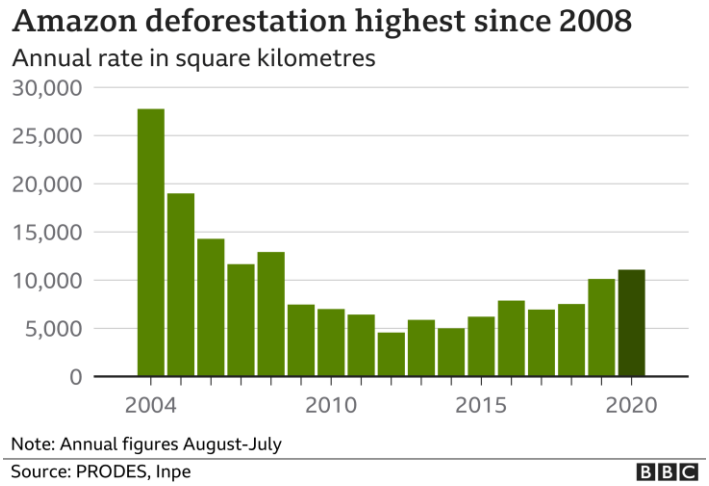


Figure 3: Levels of deforestation in the Amazon from 2004 to 2020

Sweden

Sweden ranks first[26] in regard to the successful implementation of the sustainable development goals according to the UN SDG index. Its position is favourable and is evidently prosperous hence the need for a communication body to convey such valuable and advantageous knowledge to other member states. Instead of the usual unsustainable power sources, in Sweden, trash heats homes, gives power to public transport and fuels taxis.[27]

[24] Shukman, David. "Brazil's Amazon: Deforestation 'Surges to 12-Year High.'" BBC News, 30 Nov. 2020, www.bbc.com/news/world-latin-america-55130304.
[25] Spring, Jake. "Deforestation in Brazil's Amazon Rainforest Hits Record January High." Reuters, 11 Feb. 2022, www.reuters.com/business/environment/deforestation-brazils-amazon-rainforest-hits-record-january-high-2022-02-11/.
[26] "Sweden .:. Sustainable Development Knowledge Platform." Sustainabledevelopment.un.org, sustainabledevelopment.un.org/memberstates/sweden.
[27] Yee, Amy. "In Sweden, Trash Heats Homes, Powers Buses and Fuels Taxi Fleets." The New York Times, 21 Sept. 2018, www.nytimes.com/2018/09/21/climate/sweden-garbage-used-for-fuel.html.

International Methane Emissions Observatory (IMEO)

The International Methane Emissions Observatory (IMEO) was recently launched during the G20 Summit and is a data-driven, action-focused initiative by the UN Environment Programme (UNEP) "with support from the European Commission to catalyse the dramatic reduction of methane emissions, starting with the energy sector."[28] The IMEO possess one of the few instruments to provide near-real-time, reliable and granular data of methane emissions in the atmosphere which assists in the monitoring of this potent gas. These instruments are large-scale measuring systems which monitor the atmosphere and measure methane levels for research to be conducted using this data. Furthermore, due to its global collaboration, any member state may utilise this observatory and receive aid in regards to the best action to take to fight climate change.[29]

European Union (EU)

Alongside the fact that bodies such as the European Commission offers economic aid to organisation and projects, the European Union has presented proposals on methane emission reduction. Favourably, stated by the President of the European Union, Ursula von der Leyen, the EU aims to become the first continent to turn carbon neutral in the near future, with the objective being 2050.[30] This calls for the transition to greener energy sources and adapting existing infrastructure. This will be an arduous and pivotal moment that will set the coalition of European nations in the right direction. The EU has outlined its ongoing support of the hydrogen and gas market decarbonisation package to combat the issue of the energy sector. These promising regulations offer a fresh perspective on methods to go about tackling the given issue.[31]

UNEP Food Systems and Agriculture

The UNEP Food Systems and Agriculture heavily emphasise the phenomenon of climate change and tackles the agricultural side of the issue. UNEP has been active in conducting assessments to regarding measures needed to be carried out to improve

[28] "Methane Emissions Are Driving Climate Change. Here's How to Reduce Them." UNEP, 20 Aug. 2021, www.unep.org/news-and-stories/story/methane-emissions-are-driving-climate-change-heres-how-reduce-them.

[29] Environment, U. N. "International Methane Emissions Observatory." UNEP - UN Environment Programme, 11 Oct. 2017, www.unep.org/explore-topics/energy/what-we-do/international-methane-emissions-observatory. Accessed 16 Feb. 2022.

[30] TED. "Europe's Plan to Become the First Carbon-Neutral Continent | Ursula von Der Leyen." YouTube, 14 Oct. 2020, www.youtube.com/watch?v=VHMYl70ibHQ. Accessed 15 Dec. 2020.

[31] "EU Commission Presents Proposal on Methane Emissions Reduction." Florence School of Regulation, 15 Dec. 2021, fsr.eui.eu/eu-commission-presents-proposal-on-methane-emissions-reduction/. Accessed 16 Feb. 2022.

air quality as well as the study of depleting agricultural recourses due to this problem. Through raising awareness, research, events and resolutions, UNEP has been dynamic in trying to solve the issue. This programme works with both non-UN organisations and other UN branches in order to come out with studies such as ones engendering the needed limitation of any and all types of emissions and specifies it to farming and agricultural solutions to focus on embarking on the issue from all possible perspectives.[32]

TIMELINE OF EVENTS

Date	Description of event
1980s	The proliferation of methane emissions started to be studied by scientist.
September 16, 1987	The Montreal Protocol was ratified in which it takes into consideration the ozone problem, directly linking to ground level ozone and its detrimental consequences.
August 3, 2015	President Barack Obama takes the United States, one of the largest emitters of methane emissions and passed the " The Clean Power Plan" for a greener future.
December 12, 2015	Paris Climate Agreement was adopted in the COP21 conference marking a historic turning point for climate action.
Sep 5, 2017	Canada makes a breakthrough regarding technological innovation concerning greener energy. Canada becomes fully committed to reduce methane emissions.
May 6, 2021	Global Methane Assessment was finalised and launched by the UNEP and Climate & Clean Air Coalition, outlining methane's critical roles in the increase of global temperatures.
Oct 31, 2021 – Nov 12, 2021	COP26 takes place. This is the first time after the Paris Climate Conference where real progression regarding legislative agreements and effective solutions were discussed.
November 10, 2022	Global Methane Pledge was introduced during the COP26 conference. More than

[32] "Methane Emissions Are Driving Climate Change. Here's How to Reduce Them." UNEP, 20 Aug. 2021, www.unep.org/news-and-stories/story/methane-emissions-are-driving-climate-change-heres-how-reduce-them.

	100 countries have ratified this, committing themselves to reducing methane emissions for a habitable world.

RELEVANT UN RESOLUTIONS, TREATIES AND EVENTS

Conference of the Parties 26

The COP26 conference in Glasgow was one of the most pivotal climate conferences of all time. The conference was held from 31 October to 13 November 2021 and during this time, an exceptional amount of progress was carried out. [33] Some notable achievements that happened during the conference were that more than 100 countries pledged to eliminate deforestation by 2030 as well as approximately 40 countries have committed to leaving behind coal-sourced energy. In regards to the two highest methane emitters, major countries such as the US and China will work hand in hand in the next ten years to combat climate change[34]. The most notable one however is the ratified methane bill in which EU countries along with ones such as the US, have pledged to "slash methane" aiming to decrease its emissions by as much as 30% in the next 28 years.

Global Methane Pledge

The Global Methane Pledge centralises around the aim to cut down on methane emissions by up to 30 per cent by 2030.[35] The pledge was first announced in September 2021 by the US and the EU, however since then, has been ratified by 100 other countries, leading to their supported signature and ratification for a greener future. Furthermore, Global philanthropic organisations such as the Hewlett Foundation have offered financial aid of $328 million[36] to support the scale-up of these types of methane mitigation strategies worldwide.

[33] "UN Climate Change Conference (COP26) at the SEC – Glasgow 2021." UN Climate Change Conference (COP26) at the SEC – Glasgow 2021, 2021, ukcop26.org.
[34] "COP26: US and EU Announce Global Pledge to Slash Methane." BBC News, 2 Nov. 2021, www.bbc.com/news/world-59137828.
[35] "Explained: What Is the Global Methane Pledge, and Why Is Methane Significant for Climate Change?" The Indian Express, 3 Nov. 2021, indianexpress.com/article/explained/global-methane-pledge-explained-7605172/. Accessed 16 Feb. 2022.
[36] "Press Corner." European Commission - European Commission, ec.europa.eu/commission/presscorner/detail/en/statement_21_5766.

2030 Agenda

The 2030 Agenda for Sustainable Development Goals visualises a world of universal respect for human rights and human dignity, the rule of law, justice, equality, and non-discrimination. This agenda is one that was adopted by all 197 member states in 2015, both developed and developing, as a way of showing their support for all efforts proposed by the body to guarantee an end to poverty, any and all forms of deprivation and imbalance, the betterment of education and the economy, emphasising the need for good wellbeing and the tackling of climate change. A global partnership is to be endured by all governments to work hand-in-hand to achieve a better preserved and safer tomorrow for future generations. In this agenda, more specifically, goals concerning food security and biodiversity, methane is prominent as it is evident that it is a limiting factor is disallowing countries of achieving these goals.

A/RES/74/219[37]

Protection of global climate for present and future generations of humankind

This resolution recalls past agreements and legislations and emphasises the importance of their continued progression alongside new suggestions in order to ensure global temperatures do not exceed two degrees. This ensures a habitable world for the future generation. Since methane is more potent, hence absorbing more gas, it is important that we regulate the amount being emitted into the atmosphere to ensure global temperatures do not rise.

GA/EF/3443[38]

"Expressing 'Profound Alarm' over Global Rise in Greenhouse Gas Emissions"

This resolution is regretful and alarmed over the steep increase in greenhouse gas emissions such as carbon dioxide and methane. A great emphasis on the need for alleviation of the problem and an outline for a plausible solution is drafted. It builds upon the Paris agreement and calls for countries to improve global partnership and collaboration to eradicate this issue and assist in completing the Sustainable

[37] Team, ODS. "ODS HOME PAGE." Documents-Dds-Ny.un.org, 27 Jan. 2020, documents-dds-ny.un.org/doc/UNDOC/GEN/N19/436/09/PDF/N1943609.pdf? OpenElement. Accessed 16 Feb. 2022

[38] Assembly, General. "Draft Resolution Expressing 'Profound Alarm' over Global Rise in Greenhouse Gas Emissions among 14 Texts Approved by Second Committee | Meetings Coverage and Press Releases." Www.un.org, 10 Dec. 2015, www.un.org/press/en/2015/gaef3443.doc.htm.

Development Goals. Methane is a reoccurring figure throughout this draft; with emphasis placed on the need to find plausible solutions to mitigate emission release.

PREVIOUS ATTEMPTS TO SOLVE THE ISSUE

Paris Climate Change Agreement

The Paris Agreement is a legally binding international treaty on climate change. It outlines the need to keep the rising temperatures below two degrees Celsius in comparison to pre-industrial levels. To achieve this, socio-economic transformation and betterment are required from all 196 parties, which was signed in Paris during the COP21 conference on 12 December 2015. Strong communication has been taking place concerning methods they have undertaken to reduce greenhouse emissions such as methane, to reach the goals of the Paris Agreement. The foundation of such legislation is dependent on countries' perseverance and collaboration. Due to global circumstances, original agendas have been set back, however, despite this, the Paris agreement was only minimal compared to actions that need to be taken. Future conferences such as COP26 have built upon this, as its plan was not efficacious enough to tackle this predicament.[39]

Altering the agricultural sector

As outlined previously, the altercation in agricultural practices is beyond important. Plants play a substantial role when it comes to the methane cycle as well as the effect they undergo because of its detrimental effects. Firstly, switching to a plant-focused diet as well as changing the feeding procedures to significantly reduce the release of methane must be taken. According to the UN, "the world needs to begin by rethinking our approaches to agricultural cultivation and livestock production."

POSSIBLE SOLUTIONS

Agricultural Shifts

It is critical that humanity shifts its mindsets regarding the food industry. We must take measures that rethink crop cultivation and take advantage of technological advancement in order to shift to plant-rich diets and sources of food that will give us

[39] UNFCCC. “The Paris Agreement.” UNFCCC, United Nations, 2015, www.unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement.

sufficient amounts of nutrients; so as to minimise meat consumption. Furthermore, farmers can assist in this movement by selectively breeding farm animals, discovering new types of feeding methods to reduce cow methane emissions, but also manage natural manure and faeces by repurposing it in ways such as crop fertilising, biomass energy and more. Despite the fact that crops and other forms of vegetation are not located in megacities, they are delivered there to feed the entire population hence the need of its reformation.

Creation of measurement devices to measure methane levels in the atmosphere

Companies and governments must invest in new technologies which will measure methane levels in the atmosphere. Currently, with no effective ways to do so, it has been formidable to carry out the reading of said emissions. With revolutionary innovation such as this, governments will be able to ensure air quality is safe for citizens, as well as avoid any methane exposure, which would prove terminal. It is key that these are set up in megacities for accurate results in regard to contamination levels in the air. As mentioned previously, high levels of methane can, and have led to methane poisoning hence the need for such measuring systems.

Communication between governments

It is undeniable that there must be governmental collaboration through networks such as the UN. A communication body should be created in order to share and transmit knowledge. This database should be made available to all megacities to ensure the dissemination of information and increase the rate at which methane emission is mitigated and reduced.

Invest in Renewable Energy

In order to mitigate methane emission efficiently, we must attack the root cause and foundation of the issue. A prominent factor remains to be the combustion of fossil fuels and oils; by investing in green and renewable types of energy, governments can eliminate the production of all greenhouse gases and convert them to carbon neutrality. This should be conducted in a gradual phase and follow existing treaties and their timeframe. Resources of each country can and must be taken advantage of such as the sun, geothermal and water, tame them and use them to produce electricity to be the future of megacities.

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