

Michael Dawe - Contemporary Challenges - Report and Poster

by Michael Dawe

Submission date: 01-Mar-2023 09:58AM (UTC+0000)

Submission ID: 198205337

File name: 41415_Michael_Dawe_Michael_Dawe_-_Contemporary_Challenges_-_Report_and_Poster_489722_532363746.docx (639.44K)

Word count: 1344

Character count: 8510

Contemporary Challenges: Making A Difference (ACCA4027)

E-Portfolio: Report & Poster
on the subject of Climate Change

Michael Dawe (2206831)

Contents

Introduction: 3

What is climate change? 3

What causes climate change?..... 3

What are the consequences of climate change? 4

What can we do about climate change? 4

Summary: 5

Poster: 5

References: 6

Bibliography: 7

Introduction:

The world health organization states that "Climate change is already impacting health in a myriad of ways, including by leading to death and illness from increasingly frequent extreme weather events, such as heatwaves, storms and floods, the disruption of food systems, increases in zoonoses and food-, water- and vector-borne diseases, and mental health issues." [1] This report will discuss climate change, and in particular some research related to carbon dioxide and other greenhouse gases, as well as putting forward some ways people and organisations can try to combat global warming.

What is climate change?

Climate change is a term for long-term changes in temperature and weather patterns, which can be natural or influenced by human activities. [2] While erratic and extreme weather conditions have the largest impact on society, the key factor here is temperature, because weather changes are largely a result of temperature change.

What causes climate change?

Greenhouse gasses, including carbon dioxide (CO₂) and methane, trap heat in Earth's atmosphere causing temperatures to rise. CO₂ is the largest contributor to climate change due to its abundance and longevity while methane decomposes over time and other greenhouse gases are rarer. [3]

While Earth has always followed a cycle of changing temperatures, it has been exaggerated in the last century. There are no accurate temperature measurements for prehistoric Earth, but there are statistics available for the CO₂ levels in the atmosphere. NASA has reconstructed information from the CO₂ levels of air trapped in cores of ice dating back almost a million years. These figures show that 330,000 years ago was the highest level within this time period, at 300 parts per million (ppm) of CO₂, however in 1950 there was around 310ppm, and last December there was 420ppm. [4] That is a 35% increase in just 73 years.

The main cause of increased CO₂ in the atmosphere is the combustion of fossil fuels. Fossil fuels are deposits of carbon and hydrogen dating back to the Carboniferous Period around 400 million years ago. [5] The combustion of hydrogen releases water, but the combustion of carbon produces CO₂. The carbon contained in fossil fuels was at one point in the atmosphere, but sunlight on the leaves of green plants captured the carbon and released the oxygen back into the atmosphere. These huge old plants eventually died, and their deposits formed into coal, oils and natural gas, through decomposition, pressure and heat. [6]

What are the consequences of climate change?

In the context of global warming the main consequences of climate change are increased average temperatures, bringing higher risk of drought and wildfires; sea levels rising due to the ice caps at Earth's poles melting; erratic changes to weather cycles leading to extremes, such as heatwaves, storms, and flooding; damage to ecosystems on land and in the ocean; and many more.[7]

These changes all pose a threat to society's infrastructure and culture including living conditions, food supplies and displacement of people from the most at-risk regions. Regions at a high level of risk include coastal regions around the world, including islands in the Pacific Ocean and other areas which could be completely covered by seawater. On the other end of the spectrum dry areas in the world's largest equatorial continents could become even hotter and drier making them unsuitable for life, both human and animal.

What can we do about climate change?

Two comparable sources of energy, wood and coal, are both composed mainly of carbon, and, when burnt, they produce heat and CO₂. The difference lies in the available quantities of these resources, for example if humanity only burnt wood, the production of CO₂ would be directly limited by the amount of CO₂ recaptured by the growth of trees, leading to a self-regulating cycle. However, if all fossil fuel reserves were burnt, it is natural to assume that the CO₂ levels in the atmosphere would be equivalent to those present when the fossil fuels formed 400 million years ago. In the early Carboniferous Period, before the formation of most of the fossil fuel reserves, the atmospheric CO₂ levels reached 1500ppm.[8] While green plants could flourish, these levels of CO₂ wouldn't allow for animal life as we know it.

It can be concluded that the best course of action is to match CO₂ emissions to the rate it can be recaptured. This could be done by only burning renewable resources, or by offsetting fossil fuel combustion by planting trees in other parts of the world.

Another approach is to take out the combustion of carbon from our lifestyle altogether. While fire has certainly had a positive influence on human evolution and society, are we at a stage where we can move beyond fire? Alternatives include capturing energy directly from solar radiation, or utilizing nuclear energy and taking the sun out of the equation altogether. Both these approaches are already being used, and effectively reduce CO₂ emissions, but there are potential side effects, particularly in relation to nuclear. Global warming was beyond the knowledge of the first coal miners, and similarly there could be unforeseen side effects to nuclear energy.

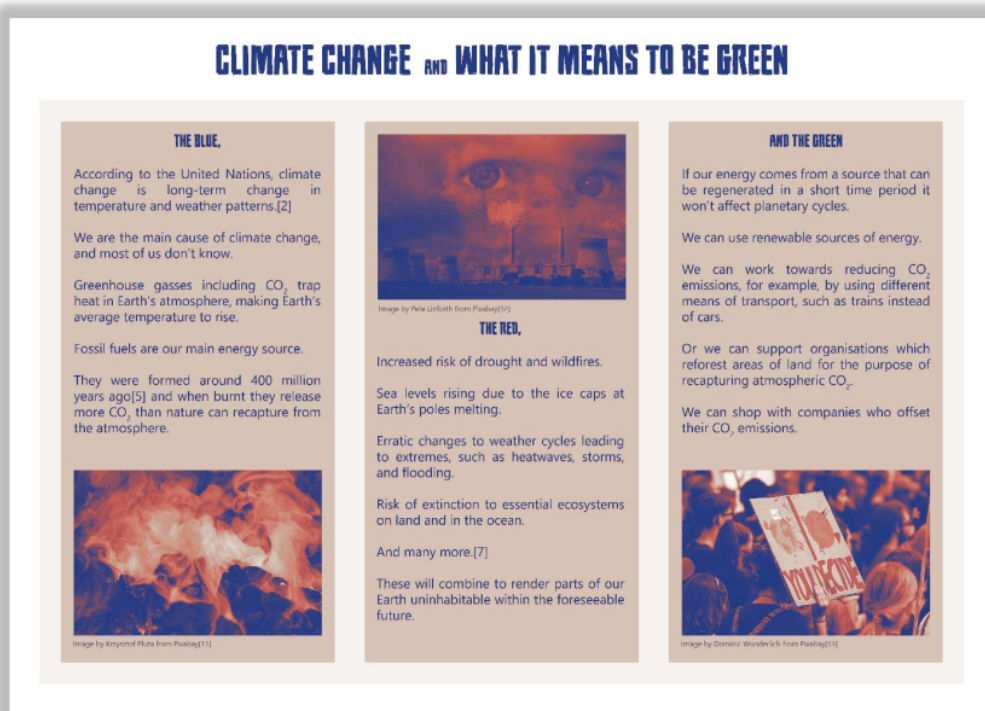
So, what can we do? Individuals can work towards reducing their CO₂ emissions, for example using different means of transport such as trains instead of cars, or by supporting organisations which reforest areas of land for the purpose of recapturing atmospheric CO₂. Organizations can work on optimizing their production or service delivery to reduce energy consumption and waste generation and can also offset any unavoidable CO₂ production.

Summary:

Climate change is a real problem, backed up by statistics, it is largely due to human decisions, and it is a problem that is already affecting people and must be taken into account now. Some answers are already known, and scientists are working on providing new solutions. In the meantime, there are things that individuals and organizations can do to reduce the harmful effects of modern life.

This report aims to present credible resources and potential solutions in a way that covers the first three stages of the design thinking process[9], which are to empathise, define, and ideate. The ideas put forward here can be prototyped, tested, and revised in an ongoing effort to find the best solution.

Poster:



References:

- [1] "Climate change", *World Health Organization*. [Online]. Available: <https://www.who.int/health-topics/climate-change>. [Accessed: 03-Feb-2023].
- [2] "What is climate change?", *United Nations*. [Online]. Available: <https://www.un.org/en/climatechange/what-is-climate-change>. [Accessed: 03-Feb-2023].
- [3] "Why do we compare methane to carbon dioxide over a 100-year timeframe? are we underrating the importance of methane emissions?", *MIT Climate Portal*, 2021. [Online]. Available: <https://climate.mit.edu/ask-mit/why-do-we-compare-methane-carbon-dioxide-over-100-year-timeframe-are-we-underrating>. [Accessed: 03-Feb-2023].
- [4] "Carbon dioxide concentration", *NASA*, 22-Aug-2022. [Online]. Available: <https://climate.nasa.gov/vital-signs/carbon-dioxide/>. [Accessed: 03-Feb-2023].
- [5] J. P. Rafferty, "Do fossil fuels really come from fossils?", *Encyclopædia Britannica*. [Online]. Available: <https://www.britannica.com/story/do-fossil-fuels-really-come-from-fossils>. [Accessed: 03-Feb-2023].
- [6] "How coal works", *Union of Concerned Scientists*, 18-Dec-2017. [Online]. Available: <https://www.ucsusa.org/resources/how-coal-works>. [Accessed: 03-Feb-2023].
- [7] "Effects of climate change", *Met Office*. [Online]. Available: <https://www.metoffice.gov.uk/weather/climate-change/effects-of-climate-change>. [Accessed: 03-Feb-2023].
- [8] J. D. Dixon, "The carboniferous period", *Darwin's Door*, 10-Jul-2021. [Online]. Available: <https://www.darwinsdoor.co.uk/timetour/the-carboniferous-period.html>. [Accessed: 03-Feb-2023].
- [9] R. F. Dam and T. Y. Siang, "What is design thinking and why is it so popular?" *The Interaction Design Foundation*, Jun-2022. [Online]. Available: <https://www.interaction-design.org/literature/article/what-is-design-thinking-and-why-is-it-so-popular>. [Accessed: 27-Feb-2023].
- [10] Blambot Comic Fonts, "Population zero BB font · 1001 fonts" *1001 Fonts*. [Online]. Available: <https://www.1001fonts.com/population-zero-bb-font.html>. [Accessed: 01-Feb-2023].
- [11] ChristopherPluta, "Smoke puffs of coal - free photo on Pixabay" *Pixabay*, 13-Apr-2015. [Online]. Available: <https://pixabay.com/photos/smoke-puffs-of-smoke-coal-bake-716322/>. [Accessed: 05-Jan-2023].
- [12] TheDigitalArtist, "Environmental pollution - free photo on Pixabay" *Pixabay*, 15-Aug-2015. [Online]. Available: <https://pixabay.com/photos/environmental-pollution-environment-4405173/>. [Accessed: 05-Jan-2023].
- [13] dmncwndrlch, "Demonstration fridays for future - free photo on Pixabay" *Pixabay*, 01-Mar-2020. [Online]. Available: <https://pixabay.com/photos/demonstration-fridays-for-future-4891275/>. [Accessed: 05-Jan-2023].

Bibliography:

Climate during the carboniferous period. [Online]. Available: https://geocraft.com/WVFossils/Carboniferous_climate.html. [Accessed: 03-Feb-2023].

A. Nace, "Creative coloring with gradient maps in Photoshop" *PHLEARN*, 22-Apr-2021. [Online]. Available: <https://phlearn.com/tutorial/creative-coloring-gradient-maps-photoshop/>. [Accessed: 03-Jan-2023].

A. Boronine, "Human-friendly HSL" *HSLuv*, 2022. [Online]. Available: <https://www.hsluv.org/v>. [Accessed: 05-Jan-2023].

Michael Dawe - Contemporary Challenges - Report and Poster

GRADEMARK REPORT

FINAL GRADE

71 / 100

GENERAL COMMENTS

Instructor

1. Engagement With Literature Skills (72%)

A good amount of research has been conducted, with a Reference and Bibliography section also provided in IEEE format – this is how all academic research you conduct for future assignments should be presented.

2. Knowledge & Understanding Skills (75%)

A good amount of information and knowledge on the subject matter of climate change has been evidenced in the written work. Defining key words and phrases, such as climate change itself, is important as the reader is then informed of necessary details – even if they think they knew beforehand, it is common practice to do this in academic writing.

The report considers the process of Design Thinking to trial solutions to the initial problem. This is good to include – in a larger report it would be good to explore this further, though I appreciate in a shore assignment like this that process can be limited by the brief.

3. Cognitive & Intellectual Skills (73%)

A very good analysis of the problem and it's solutions has been evidenced in the work – addressing the balance to the world's ecosystems is a plausible and feasible fix – it just

needs the co-operation of global societies.

4. Practical Application Skills (66%)

The report is well structured, clearly written and based on a good amount of research sources. To enhance the document a little more it would be good to see some visual information included – charts of CO2 levels increasing over time, or other similar visual graphs, charts, etc. These can support your statement in the main text, and break up the written work for the reader.

The poster is presented in an Academic format, but is not overwhelming with its information – this is good. I particularly like the theme with colours for categories, tying in with the tagline. This is a more intellectual approach which suits the topic well. Personally I would leave out the 'and many more' section of the Red, only because it doesn't add much to the information already conveyed – might be good to combine it with the closing statement to remind people that the damage is far-reaching and not just limited to the key points being raised here. Overall this is a very good piece of work – well done.

5. Transferrable Skills for Life and Professional Practice (68%)

All elements of the assessment have been completed and submitted to Turnitin before the deadline date. The E-portfolio is well presented and very accessible with a cover sheet, contents page, references and bibliography. This is a good standard of work – keep it up!

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7
