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## Antarctica and Global Warming: Probability or Certainty?

04 06 08

CAN CARBON  
CAPTURE TECH  
SAVE US?

THE EARTHSHOT PRIZE:  
REPAIRING  
OUR PLANET

OMICRON AND  
THE REACTION OF  
OPEC



# In This Issue...

## 04 ..... Can Carbon Capture Tech Save Us?

By December 2021, we just exceeded the carbon dioxide (CO<sub>2</sub>) threshold of 416 ppm. CO<sub>2</sub> levels in the atmosphere are already excessive. CO<sub>2</sub> levels in the atmosphere are already excessive...

## 06 ..... Documentary Review - The Earthshot Prize: Repairing Our Planet

In the last weeks of 2021, I would like to talk about a documentary that has recently made a worldwide impact on climate change. 2021 has been published in many documentaries...

## 08 ..... Omicron and the Reaction of OPEC

Let's firstly explain what happens after the Omicron emerged. Omicron's origin has not been known yet, but we know it was discovered firstly in South Africa and reported firstly by South Africa's doctors. Just after that news, we have heard that the United Kingdom has banned the travel-flight from South Africa...

## 10 ..... Antarctica and Global Warming: Probability or Certainty?

Is it really correct to think of a relationship between human activities, Antarctica, and global warming? To answer this question shall be the main topic of this paper but to comprehend the answer better, there will be a quick background information introduction...

BRENT OIL

70.90 \$/BL

GASOLINE

11.68 ₺/LT

USD/TRY

17.82

DIESEL

11.57 ₺/LT

EUR/TRY

20.18

FUEL OIL

10.59

EDITOR:

GÖKBERK BİLGİN

CONTACT: gokberk.bilgin@bilkent.edu.tr

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# Can Carbon Capture Tech Save Us?

Büşra Öztürk 

By December 2021, we just exceeded the carbon dioxide (CO<sub>2</sub>) threshold of 416 ppm. CO<sub>2</sub> levels in the atmosphere are already excessive. As a part of the solution, we are transitioning to renewables, recycling, reusing. However, we must now do more than just reduce emissions to properly ensure a sustainable climate for future generations: We must also remove CO<sub>2</sub> from the atmosphere.

As the most known removal technique, photosynthesis captures the CO<sub>2</sub> in the air and releases it into the atmosphere as oxygen. Per contra, we have neither an adequate bunch of trees nor the time for planting to eliminate the current carbon emissions we produce in nature before it is too late. In this respect, we may consider artificial ways for photosynthesis under carbon-negative technologies. The most popular one is carbon capture.

Carbon capture is not a new technology, the usage has been dating back to the 1970s. The main purpose of inventing this technology was to enhance oil production by injecting captured CO<sub>2</sub> into existing oil fields. The procedure could be briefly explained as injecting CO<sub>2</sub> increases the overall pressure in an oil reservoir and pushes more oil to a production wellbore. Nowadays, carbon capturing has been

glimpsed as a way out to meet up reducing and removing carbon emissions.

The current extensively used technology mainly prevents the disperse of CO<sub>2</sub> into the atmosphere from power stations and industrial plants which are the main sources of greenhouse gas emissions. This method helps with stopping putting CO<sub>2</sub> into the air to great extent during industrial production. The most advanced and adopted capturing method is done with chemical absorption that grabs CO<sub>2</sub> by reacting it with a chemical solvent. Other processes include physical separation, oxyfuel separation, membranes and looping cycles. Then, the CO<sub>2</sub> is compressed so that it could be transported via pipeline. Where the captured carbons could be held and for what purpose the stored could be used are still open questions. The entire procedure is called carbon capture, utilisation and storage (CCUS).

CO<sub>2</sub> in the air could also be directly captured through the Direct Air Capture (DAC) technology. The target of DAC is low concentration CO<sub>2</sub> in the atmosphere. Nonetheless, this capturing method is currently not widespread in usage since it is a reasonably expensive proposition. There are plenty of startups that run direct air capture and share





openly their licenses that technology anywhere. One of them, Carbon Engineering, expects to capture 1 million tonnes of atmospheric CO<sub>2</sub> per year which is equal to the carbon removal work of approximately 40 million trees with a cost of 200\$ per ton.

Carbon capture is an important part of the cycle of energy. The cycle occurs as, shortly, the captured CO<sub>2</sub> from mainly power stations turns back as the fuels or energy to be used. That cycle could bring carbon neutrality into reality if all emitted CO<sub>2</sub> could back into the atmosphere without producing new. In this sense, it has a huge potential to make a big difference regarding greenhouse gas emissions. Also, the International Energy Agency (IAE) underlines the importance of the technology by a warning that meeting climate targets without capturing and storing emissions from factories, power plants, transportation, and other sources will be "virtually impossible."

There are currently 21 CCUS plants and 19 DAC plants operating across the world, with the capacity of capturing up to 40 Million tonnes and 11 thousand tonnes CO<sub>2</sub> per year, respectively. The majority of the projects are implemented in the United States and Europe, but there are also new plant

plans in Australia, China, Korea, the Middle East, and New Zealand. Unfortunately, carbon capturing has a low share at present when compared to overall emissions, which are 33 billion tons per year. IAE reports indicate that if the new projects could be embarked, global CO<sub>2</sub> capture capacity would be reaching roughly 1150 Mt CO<sub>2</sub> from CCUS and 85 Mt CO<sub>2</sub> from DAC per year by 2030.

In my opinion, carbon capture technology can really help us to tackle climate change and reduce greenhouse gas emissions in a great manner if the tech grows up all around the world. It may indeed not absolve the world of the need to reduce and remove emissions, but it may ease the path to net zero emissions by 2050 and a global temperature rise of less than 2 degrees Celsius, as the main purpose of the Paris Climate Agreement. In other words, it is only a part of the solution, and we need to find the other pieces of the puzzle of the carbon issue as well.

Additionally, be kindly aware of the contest of Carbon Removal X which is funded by Elon Musk and the prize is \$100 million dollars for those who build CO<sub>2</sub> removal solutions at 1000 tonnes per year and present a model for billion tonnes in the future.

# Documentary Review - The Earthshot Prize: Repairing Our Planet

Başak Bozoğlu 

In the last weeks of 2021, I would like to talk about a documentary that has recently made a worldwide impact on climate change. 2021 has been published in many documentaries about climate change, extinction, protection, and restoration of nature and ecosystem changes. The Earthshot Prize: Repairing Our Planet is the last one organized by a council, including the British royal family.

The documentary consists of five episodes; protect and restore nature, fix our climate, clean our air, revive our oceans and build a waste-free world. The documentary is hosted by Prince William and narrated by David Attenborough. Besides many documentaries broadcast on Netflix, this documentary does not offer you a solution to change the world. Earthshot Prize aims to find solutions for five ambitious challenges until 2030. These challenges demonstrate with the winners' projects that can be applied for the next ten years to solve each problem. Even though it is the United Kingdom-based Prize, problems, solutions, and projects are open to the whole world. In the Earthshot Prize, one million-pound prize will be awarded each year for the next ten years five times for providing at least 50 solutions to the world's greatest environmental problems

by 2030. The aim is to use the prize for funding to support the potential and existing innovations to be a solution for our planet.

Among these five chapters, the one that caught my attention the most was a "Waste-Free World." There is an endless cycle in nature, everything turns into each other, and the order continues in this way. However, today, the consumption rate has increased with technology and rapid production. As human beings increased the use of raw materials, production increased, and people started to leave one thing and have a new one. Therefore, the endless circle in nature has been broken by human hands. This situation creates the problem of excess and non-recyclable waste for most countries. Developed countries can recycle some of their waste but send the rest to underdeveloped countries. One country's garbage becomes another country's problem. Plastic, synthetic fibers, metal, and glass are produced for longevity. However, much more than what is recycled continues to be a problem as waste.

For instance, The United States alone ships over half a million tons of plastic overseas, and most of it ends up in countries with poor waste management systems.





Turkey imported a total of 659,960 tons of plastic waste from European Union countries and England in 2020. At the same time, some of the imported garbage was destroyed by illegal burning, mixed with rivers, scattered in nature without recycling in Turkey.

Each episode has different nominees from different countries such as Kenya, Mongolia, the United States, and Italy in the documentary. The most helpful information for the fifth part is that the candidates offer the most suitable solution for their region, again according to the conditions of their territory. While someone presents a project to recycle wastewater, someone produces a project to recycle waste food. As nominees offer solutions specific to the region where the problem occurs, this situation creates viable solutions for the people living in the area. Last week, the news highlighted the garbage problem in Rome. The accumulated garbage and non-recycled waste have become a massive problem because they are not collected for long, and a permanent solution is not produced. It has caused political and social difficulties because a suitable solution to the region's problem has not been produced. This example shows that underdeveloped overseas countries and Europe have a waste problem.

The most valuable part of the documentary is where solution-oriented projects are mentioned. The fact that it is not only focused on America and Europe but also includes regions with different waste problems, such as Japan and Kenya, makes the document special. However, the documentary remains relatively superficial with its five episodes. Our Planet, A Life on Our Planet, Blue Planet, made by David Attenborough for the BBC, are much more successful in terms of informing people. The Earthshot Prize: Repairing Our Planet is more like a promotional documentary that could lead to good results on which the royal family puts a cash prize. However, people can watch with pleasure with good visual quality and interviews in different cultures. Also, people can watch it easily because each episode is forty minutes and focus only on one problem's varieties in the documentary. As a result, it is a significant production to attract media attention and shows that not only scientists but also citizens can find useful and applicable solutions to real problems.

# Omicron and The Reaction of OPEC

İbrahim Halil Aslan 

Let's firstly explain what happens after the Omicron emerged. Omicron's origin has not been known yet, but we know it was discovered firstly in South Africa and reported firstly by South Africa's doctors. Just after that news, we have heard that the United Kingdom has banned the travel-flight from South Africa. The market perceived this news as a new concern and new uncertainty in the following days. Brent Oil fell about 11 percent in a day when the news had been heard, while WTI dropped around 13 percent in the same day. Then, most countries had taken similar actions to keep the new variant away from their borders as soon as possible. Nevertheless, the new variant, named Omicron, spreads around the whole globe at an unprecedented pace and reveals a fear

of being in the same situation as what happened in the first Covid-era. Even Israel became the first country to shut its borders to foreign travelers. Japan followed the same path and decided to take the same action, closing borders to the foreign traveler because of the fear of new variant. Turkey also announced first time six covid cases caused by Omicron. Omicron has been reported in 58 countries, and WHO expects the number to continue growing.

All market traders carefully follow what The World Health Organisation says and offers to countries after Omicron. WHO has explained the effect of Omicron since the time Omicron is heard. On 8 December, The World Health Organization said

the highly mutated omicron variant of Covid-19 could change the course of the pandemic. While there exists a risk of changing the course of the pandemic, how it affects oil prices is about curiosity. Therefore, all eyes are on the Organization of the Petroleum Exporting Countries (OPEC). World's biggest oil producers were met on 2 December with a video conference to evaluate the latest news of the new variant, Omicron, and to discuss how much this new variant impacts energy demand. In this meeting, the biggest anxiety was if this new variant of the coronavirus cuts down on economic recovery. They also discuss the discomfort of the United States and China for high oil prices and the desire for oil prices to go down. Right here, I should open a parenthesis and





say that as I specified in my previous writing about the fact that US is likely to release its strategic petroleum reserve to put decreasing pressure on oil prices since CPI is mostly composed of energy, it came true and the US announced that it is to release 50 million barrels from its strategic petroleum reserve. According to the plan announced, 32 million barrels will be used to exchange in the following months, and the remaining 18 million barrels will be sold as an acceleration of determined sale. Before the video conference of OPEC, Joseph McMonigle, Secretary-General of the Riyadh-based International Energy Forum, commented that "I anticipate OPEC+ energy ministers will maintain their current plan of adding more supplies to the market gradually."

McMonigle continued, "However, certain unforeseen external factors such as a release of strategic reserves or new lockdowns in Europe may prompt a reassessment of market conditions."

Non-OPEC leader Russia turns out that there would be no need for urgent action on the oil market. As a result of the meeting done on 2 November, OPEC picked the easy way and adhered to its previously agreed program of gradually increasing oil supply in the market. The increase in oil production will be 400.000 barrels per day in January, as decided in the previous months. However, the expression "make immediate adjustments if required" used in the meeting makes some analysts think. This is because

this statement can be commented like OPEC is intended to change their announced action according to the latest developments on the oil market, coronavirus and its variants, and the use of strategic petroleum reserve. It may reconsider its production level, decreasing production if it sees any threat appears even before the next meeting.

# Antarctica and Global Warming: Probability or Certainty?

Halil Öztürk

Is it really correct to think of a relationship between human activities, Antarctica, and global warming? To answer this question shall be the main topic of this paper but to comprehend the answer better, there will be a quick background information introduction:

Antarctica is, as you know, a unique continent due to its being on the average coldest region on earth. Unfortunately, this uniquely beautiful land is referred to for global warming, and the word "Antarctica" is often accompanied by the word "melting," and if a person likes to surf on the Internet, or watch the TV, maybe s/he sees some news upon Antarctica's being melting on a daily basis. To exemplify, on the BBC website, except daily news on global warming, there is a part named "Future Planet" for a sustainable world, which includes writings about sustainability closely related to global warming and some of which includes the "problem of Antarctica." At this point, before continuing, I want to introduce a United Nations (UN) body, Intergovernmental Panel on Climate Change (IPCC). The IPCC provides regular assessments of the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation. The IPCC attempts to reach a consensus among hundreds of scientists, diplomats, and politicians, which is seen as impossible. Suppose, we accept the following

statement that one cannot talk about international affairs without knowing the letters UN. In that case, we may accept the following statement that s/he neither can talk about climate change without knowing IPCC.

To continue, generally, we say, indeed are said, that human is responsible for melting the ice in Antarctica, which will bring us just trouble such as shortage in clean water in the future, flooding, and so forth. Nevertheless, is this claim is perfectly correct? Answering this question shall be the main focus of this paper, where I will only give some information without personal calculations, ideas, etc.

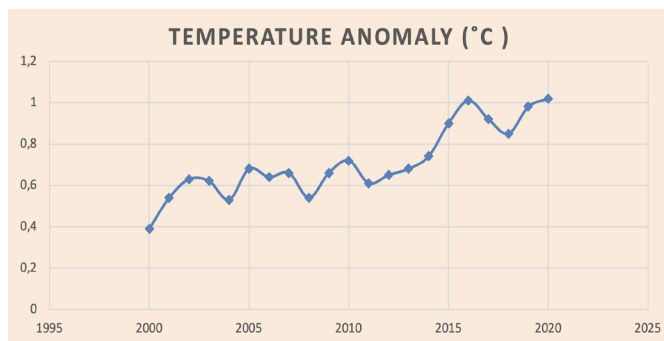
Antarctica is melting. The statement we will investigate is simply that "human makes Antarctica be melting." As investigating, we will point out two different aspects.

Firstly, in 2007, IPCC Fourth Assessment Report claims that it is very likely that global climate change of the past fifty years due mostly to human activities; very likely is equivalent to more than 90% here as said in the report. With an elementary probability knowledge, it means that there is a 10% chance to claim we cannot blame humans for global warming. Also, the Figure 1 reflect some bumpy fluctuations in temperature anomaly year by year; what





caused such fluctuations, we cannot know because if we use relative frequency of probability, we know that if you flip a fair coin 100 times, you do not always see a 50 head 50 tail



Source: NASA

case. Therefore, the source of these fluctuations may be rooted in some natural events instead of human activities.

Secondly, according to NASA, between 2002 and 2020, Antarctica shed an averagely 149 billion metric tons of ice per year, which contributes to global sea levels, which appears the effect of global warming. Nonetheless, maybe the appearance does not reflect reality. IPCC scientists, in 2000, estimated the relationship between total ice change and global warming. Startlingly, without exception, all the

scientists predicted that global warming would increase the ice of Antarctica. The reason why this was the result is actually simple: The warmer weather, the more evaporation of water, which means added snow and expectation for growth in Antarctic ice mass; also, it ought to be noted that with a 1 or 2 Celsius warming, Antarctica remains very cold. On the other hand, we have hitherto seen that Antarctica is melting. That is a contradiction, and naturally, this conclusion does not disprove global warming. Instead, we can understand that our warming understanding is not enough to say something exact about melting in Antarctica. Ergo, when we hear some news on Antarctica's being melting and its relation with global warming, we can understand that it could be, not necessarily, it is.

In conclusion, global warming is an issue debated literally everywhere, every day by everyone. The statement "Antarctica is melting" makes this issue more frightening for some of us. However, interestingly, there is no such perfect information relating the problem of Antarctica with global warming as we thought. Instead, there is a probability.



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