

Scientist publishes “escape route” from global warming

Erwartete Schülerleistungen

Leistungsfach- und Grundfachanforderungen:

1. Describe the general meaning of the word “escape route” and why it is, according to Professor Crutzen, at first glance necessary to think of such a possibility for our environment?

An "escape route" is the last possibility to cope with the problem that seems to be unsolvable. Professor Crutzen is convinced that the attempts to limit the amount of greenhouse gases are just useless and without any chances of success.

2. Explain how this “escape route” could scientifically function and what exactly would have to be done by engineers?

Professor Crutzen thinks of an artificial cooling of the global climate by releasing particles of sulphur in the upper atmosphere to reflect sunlight and heat back to space. High-altitude balloons would have to be used to "scatter the sulphur high overhead" or it could be fired into the atmosphere. Professor Crutzen mentions possible methods to do so as well as timescales.

3. Analyse why Professor Crutzen thinks that measures of “geo-engineering” are the only solution to the problem of global warming on a scientific basis?

Professor Crutzen mentions once more the necessity of cutting down emissions of carbon dioxide all over the world, otherwise the global temperature will rise. But if this is not done and the temperature rise cannot be prevented, it will be necessary to use climatic engineering in order to save the planet. But it will also be necessary to know the side-effects. It should therefore be no longer regarded as a taboo to think about “geo-engineering”.

4. What natural phenomenon related to “geo-engineering” does Professor Crutzen mention? Comment on the possibility that such an event could be man-made.

A natural phenomenon as described by Professor Crutzen is the volcanic eruption of the Mount Pinatubo in 1991. Sulphate particles were ejected into the atmosphere and as a consequence the temperature of the earth decreased in the following year. The sulphate particles were functioning as little mirrors that reflected the light back into space. Sunlight could not reach the ground. Scientists could try to release sulphur into the stratosphere, because the lasting time there is about two years longer than in the troposphere.

Nur Grundfachanforderungen:

5. Taking the high costs of the “escape route” into consideration, why does it seem nevertheless reasonable to put that kind of “geo-engineering” method into practice? Comment on possible dangers that could threaten our world if this method is not used.

This process seems to be the last chance to prevent our planet from being destroyed. Professor Crutzen mentions the coastal flooding which is only one consequence of global warming. Other possible consequences are the melting of the arctic poles, the dying of various species that live along the coasts, the mixing of salt water and freshwater etc. (more examples may be given)

6. The world seems to be in danger. Not only global warming will harm our environment. Name at least two other environmental dangers and comment on causes, consequences and possible solutions. Mention your own opinion on these problems.

(schülerabhängig)

Nur Leistungsfachanforderungen:

5. *Global warming – a threat to the environment and the whole of mankind. Why is it very much talked about at the moment? Comment on the global aspect of this phenomenon and analyse why this problem can only be fought globally.*

It is much talked about at the moment because of the incredible position of the USA that rejects international actions to reduce CO₂ emissions worldwide. This is even more dangerous because the USA is the country with the highest CO₂ emissions in the world. But CO₂ emissions do not stop at the national borders of a country. There must be an international effort to prevent the worst from happening. Globalization cannot only be understood in an industrial and economic sense, it must also be seen as an international duty to decrease harmful emissions. (more examples may be given)

6. *Professor Crutzen paints a very negative picture of the global environmental situation. Little is done to prevent the worst.*

Write a letter to a UN environmental organization explaining the situation of the earth and stressing the urgent need for all governments of the world to prevent a disaster. Name reasons and consequences of global warming and other environmental problems and try to persuade the person you are writing to that something has to be done. Write at least 150 words.

(schülerabhängig)

Bei den Antworten mit dem Vermerk (schülerabhängig) sind die eigene Meinung und das eigene Argumentationsvermögen des Schülers gefragt. Dies erfordert eine schlüssige und sachkundige Argumentation belegt mit Fakten aus dem bisherigen Lernstoff.

Die Akzeptanz der Antwort wird vor allem durch eine sachlogische und Faktenrichtige Bearbeitung geleitet.