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Why is global "greenhouse gases", which Greenhouse gases have warming getting function to maintain the various components, but worse in the first temperature. carbon dioxide (CO₂) in place? particular has a large capacity to retain heat. Greenhouse Gas Heat Heat CO2, etc. Industrial development is causing massive amounts of So, in order to stop global warming, we need to reduce CO₂ to be emitted, and the the amount of CO₂... capacity to retain heat has become too strong! 1 Greenmake base Hea Heat N 尿 CO2, etc.

The Earth's atmosphere

contains what we call

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Why Does Global Warming Occur?

Thanks to greenhouse gases such as carbon dioxide (CO_2) , the temperature of the Earth is kept constant. However, if these gases increase too much, the Sun's heat which had originally been discharged back into space remains in the atmosphere, causing the Earth to become over-warmed. This results in global warming.



• Function of Greenhouse Gases and Mechanism of Global Warming

No Ea th

Now I see that greenhouse gases are essential in keeping the Earth's temperature constant, but cause global warming if they increase too much!

The Atmosphere's Carbon Dioxide is Still Increasing

Along with industrial development, we have come to use large amounts of energy to make our lives convenient. When we produce energy such as electricity by burning a lot of fossil fuels (such as coal, oil and natural gas), CO₂ is discharged into the atmosphere. Especially after the Industrial Revolution, the concentration of CO₂ in the atmosphere has risen sharply, becoming one of the causes of global warming. Yearly Change in Concentration of CO₂ in the Earth's Atmosphere (past 50 years)



Will the Earth be in BIG Trouble if Global Warming Continues!?

The effect of global warming is said to become significant when the rise in temperature exceeds 2-3 degrees, and have serious consequences if it rises by almost 5 degrees.

• Islands may disappear!?

Sea level is said to be rising due to the heat expansion of seawater and the melting of onshore ice such as Greenland. If global warming continues at this rate and temperatures keep rising, areas just above sea level may become submerged.



Abnormal weather all over the world!?

Abnormal weather is said to have been increasing for the past several decades. Huge typhoons, torrential rains and long droughts have been occurring every year in many places, causing harm to many people. Climatic instability due to global warming is said to be one of the causes of this abnormal weather.



Crops may become ungrowable!?

When the temperature of the Earth rises, crops which grow only in warm areas can sometimes thrive in other areas. On the other hand, if the temperature rises further, some crops that used to thrive may perish.



• Epidemics may occur!?

Due to global warming, organisms carrying infectious diseases may widen their range of activities, resulting in types of diseases which have not been epidemic to date spreading in various areas.



We must start right away and reduce greenhouse gases to protect our lives and nature!





What is CCS Technology?



CCS is an abbreviation for "Carbon dioxide Capture and Storage". It is a technology where the carbon dioxide (CO₂) emitted by industrial plants and power stations is not released into the atmosphere but is collected and stored in deep underground layers for a long period of time.

Reducing the Amount of Greenhouse Gas Emissions by Half by 2050?

In the 2008 G8 summit held in Toya-ko, Hokkaido, a goal was set to reduce the amount of greenhouse gas emissions on the Earth by 50% by 2050.

• Energy conservation and renewable energy



How Effective is CCS Compared to Other Measures of Reducing Carbon Dioxide?

Among the various approaches to reduce carbon dioxide, CCS technology is considered capable of reducing 19% of carbon dioxide emissions in 2050.

Main technologies for the reduction carbon dioxide emissions







What Does the Layer That Stores CO₂ Look Like?

 CO_2 collected from industrial plants and power stations is injected into a "reservoir", a porous layer consisting of material such as sand, located at depths greater than 1000m below the surface. It is necessary that the reservoir is overlain by a "cap rock", a layer formed of mudstone and the like through which the carbon dioxide does not permeate. The cap rock serves as a lid, and prevents the injected CO_2 from leaking to the surface.

Conceptual diagram of a cap rock and reservoir





The essential point is that there is a proper "cap rock" which serves as a lid above the "reservoir" that stores the injected CO₂!

Investigations Taking Place in Various Places in Japan

Not all places are suitable for CCS. An extensive geological survey is conducted whereby large volumes of geological data are collected, evaluated and analyzed in detail in order to make a decision as to whether the place is fit for storing CO₂. Various methods are used in the investigation of the site regarding its suitability for CCS.

survey well

 Drilling of a survey well to collect geological data • Geologic samples taken in a • 3D seismic survey





• Taking gravity Measurements









I didn't know they were doing such extensive surveys using so many different methods!

I hope CCS starts as soon as possible in Japan in order to reduce CO₂!









Major CCS Projects being Developed in the World

CCS is an important technology to reduce CO₂ emissions. Though it is still in the pilot phase in Japan, this technology is already being utilized worldwide to reduce CO₂.



Global Warming is EVERYONE's PROBLEM! We should all give it a good thought and solve it together!