CO2 wanted: Is the solution in Atlantis?

Author: Silent-Power
Date: June 21, 2023

“Atlantis, the mythical island state mentioned in Plato’s dialogues, is said to have been once swallowed by the sea. This could be the key to tackling the increasing CO_2 pollution. Since industrialisation, man has thrown the great natural cycles out of balance. By extracting the CO_2 dissolved in salt water and converting it into methanol, mankind could find a way out of its self-inflicted CO_2 emergency.” – Silvio Bonzanigo

«Diiepér, diiepér», whispers Geneva’s Jacques Piccard in his pidgin American to the naval lieutenant Don Walsh. For five and a half hours on this 23rd January 1960, the two of them have been on their way in the two-metre narrow pressure capsule armoured with 13 cm Krupp steel in the submarine *Trieste*[1] to the deepest point of the world’s oceans, the Challenger Deep in the Mariana Trench, south-west of the island of Guam. So Walsh navigated Trieste even deeper, until it was finally only four metres from the sea floor. 6,203 Fathoms is indicated by the manometer, which is 11,340 metres. Absolute depth record! A pioneering achievement! US President Dwight D. Eisenhower later happily confers an honorary award.

The salt of life lies in the sea

However, the depth data shown was incorrect. The landlocked Piccard had calibrated the instrument in fresh water, but salt water has a different specific gravity. A correct depth indication is very difficult, it is 10'984 ± 25 meters[2].

In a different context, Piccard later wrote: «That's when I became aware – the sea is really salty.» After further diving trips he states: «The seas are polluted!» From his point of view, environmental protection is a necessity, and he strongly stigmatizes nuclear waste and waste from fossil energy production. Piccard therefore founded the *Fondation pour l'étude et la protection de la mer et des lacs* in Cully, near Lausanne. As early as 1963, Piccard spoke on Swiss television of a future "*énergie propre*" and dreamed of an energy system «that could function indefinitely in a cycle.»[3].

A good 50 years later, it is once again Swiss technological innovation that is making a name for itself exactly as Piccard intended. The ingredients that drive it are the same: salt water, environmental protection and an unlimited, climate-neutral energy cycle

Think Big in four processes

There are the great technical inventors – Jacques Piccard was undoubtedly one of them – and then there are inventors for processes. These include the team captained by Prof. Dr. Urs Weidmann from Silent-Power AG. For years, he and his team have been researching processes that have already been developed and which allow mankind to do without both nuclear and fossil fuels. These processes are individually tested for their suitability to be incorporated as individual components into complex concept chains.

Silent-Power wants to respond to global energy problems with smart questions, surprising – and sometimes provocative -answers and project ideas. Thinking in large, complex contexts is one of Silent-Power's natural basic competencies. This credo «Think Big» for all energy processes does not stop at the CO_2 problem.

The concept of Silent-Power to describe the large CO_2 cycle must be separated into at least four processes for better understanding. Like vectors in a 4-D diagram, the following must be distinguished: 1) developments on the time axis, 2) scientific findings, 3) scaling of the CO_2 problem, 4) costs and political framework conditions. Only then can the four processes be combined into a concept

Developments on the time axis

On the planet Earth, nature shaped those beings who were later to become our ancestors by helping them adapt to changing environmental conditions. For 300,000 years, man has populated the Earth, majority of the time in an uncrowded environment. Mankind practiced agriculture, hunting and fishing, and cut down forests to obtain wood for fire. With the flowing power of water, they began to operate mills and sawmills. Finally, the generator made it possible to convert water power into electricity. There is no noticeable CO_2 pollutant discharge into the atmosphere from these activities.

Until the beginning of the Industrial Revolution in the mid-18th century, the world's climate was in equilibrium: the CO_2 absorption capacity of the oceans was sufficient to compensate for the amount of CO_2 produced on land masses. Air masses rotating over land and water established the exchange.

Then man began to use coal on a large scale. The population of the Earth grew significantly, and the desire to cook as well as keep warm during the colder months arose. This use of the newly discovered energies, limited at the time to coal and wood, released CO_2 – at first on a modest scale. Decades later, natural gas and crude oil were discovered. Their exploitation and multifaceted use increased CO2 emissions.

View at Coal-fired power plant near lignite mine garzweiler in Germany
Medicines and artificial colors were discovered and energy-driven mobility invented. Hills of forest disappeared in the high furnaces of the steel industry. Farmers mechanized agriculture and housing developed into industry. In the modern world, nothing worked without energy.

Since the beginning of industrialisation, the concentration of CO_2 in the air has risen by 44 per cent to its highest level in 800,000 years. This CO_2 released by civilisation was previously bound in coal,

gas and oil. Now it escapes into the atmosphere because it can no longer be absorbed in the natural CO_2 cycle.

Scientific findings

Carbon dioxide (CO_2) is harmless to humans in low concentrations, if it wasn't, we would no longer be able to work in shared open-space offices where the presents emit CO_2 through breathing. The CO_2 concentration in the atmosphere is modest compared to salty seawater, where the concentration is one hundred and twenty times higher (0.099 kg CO_2/m^3).

The sun's energy radiation warms the earth and thus makes life on it possible. The atmosphere plays an important role in this: it consists of various gases at different heights, which partly reflect energy-rich radiation and partly allow it to pass through. The Earth's surface absorbs part of this energy and reflects another part, mainly via the ice caps at the North and South Poles. The absorption and radiation of solar energy once presented a balance that ensured that the Earth was and remained habitable for plants, animals and humans.

The greenhouse effect illustration infographic natural process that warms the Earth's surface. CO_2 in the atmosphere, which can no longer be bound by the oceans, influences this balance. Thus, since industrialisation, the amount of carbon dioxide and other gases[4)] in the atmosphere has increased massively. Due to complex processes, the atmosphere absorbs more solar energy than it radiates – the planet and the air layers close to the Earth consequently warm up.

Scaling the CO_2 problem

CO_2 emissions from human-initiated processes amount to more than 35 gigatonnes per year. The amount released in the natural cycle and captured by saltwater is around 90 gigatonnes per year. The CO_2 bound in salt water worldwide is estimated at around 1,000 gigatonnes.

The CO_2 problem was not on the world agenda until humans unbalanced the natural CO_2 cycle. The oceans absorb about a quarter of the CO_2 produced by

humans from the air without an upper saturation limit. This means that the CO_2 content of the oceans is constantly increasing – by almost 40 percent since industrialisation.

The higher the CO2 content in the air, the more CO2 is absorbed by the sea
This process shifts the pH value from clearly basic to moderately basic. The consequence of this development towards "over-acidification" is dramatic and at least as serious as the CO_2 input from human activity on the air: fish, crabs, sea snails, corals and other marine creatures are endangered in their continued existence because falling pH values first impair skeleton formation and eventually make it impossible.

The public should therefore not focus on the CO_2 content of the air. It is far more urgent to discuss the CO_2 problem of the world's oceans. The Earth's CO_2 problems cannot be solved if the CO_2 situation of the oceans does not improve.

Costs and political problem

Measures in favour of environmental protection are always decisions in opposition to comforts. They come at the expense of unlimited growth with high availability of goods and services at low financial cost. Especially in the face of a rapidly growing world population, such decisions are fraught with risk. Only prosperous economies can afford to invest in environmental protection; others find themselves unable to do so.

The CO_2 problem in the atmosphere and oceans is getting increasingly worse. The goal of various climate conferences was and is to prevent the collapse. They strive for a unified approach by as many nations as possible. Political and economic traps of all kinds lurk here: who can blame a state with exploding population figures if it first wants to provide food, housing, education and employment before taking care of environmental concerns? What institution can legally prohibit short-term profit in favour of a long-term intact environment? Compliance with environmental standards requires further systematic control, which does not add value to the national economy.

For the time being, the growth of the world's population and the increase of CO_2 in the air and water are happening much faster than the pace of politics. The conviction that we must intervene on climate change is catching on only lately and slowly. Global governance of politics would be an ideal prerequisite for this; however, it will remain an illusion. But every nation can learn from the best: initially only a patchwork of active

confessors and implementers, eventually a comprehensive, world-wide plea by all nations to protect the environment for the benefit of their descendants – it is not entirely unthinkable!

Four processes add up to the concept

Now the four processes combine to form the concept of the great CO_2 cycle. The concept aims to restore the originally stable CO_2 cycle, which is now out of balance, to its original equilibrium. This concept requires human intervention in an originally intact system. A system that has become unbalanced due to human activity. Jacques Piccard called this desirable balanced state *calm plat*[5)] – an all-round equilibrium.

The large CO_2 cycle relies on the CO_2 bound in the salt water of the oceans. It is available in almost infinite quantities. Carbon dioxide, extracted from seawater, can be converted into the environmentally neutral energy carrier methanol in a synthesis process. This can be used universally as fuel, energy storage and energy source for combined processes (electricity, cooling, heat).

Silent-Power aims to reduce CO_2 emissions in industry, commerce, households and transport. It does this by converting CO_2 into synthetic methanol and this into electricity, heating and cooling energy.

How the CO_2 needed for this concept could be extracted from the oceans is currently under examination. Existing oil and gas rigs could be converted to extract CO_2 from the sea. The processing into methanol would also take place on the drilling platforms. However, the seabed would not be drilled into as in the extraction of oil or natural gas, but left intact.

Methanol production requires large amounts of electricity. It goes without saying that methanol is to be obtained in a climate-neutral way via solar cells and wind power plants. Like crude oil or natural gas, the methanol produced could be transported from the drilling platforms via pipelines or on land by tankers.

The widespread use of climate-neutral methanol in industry, for mobility, electricity, cooling and heat generation would reduce the excessive CO_2 content in the air, ideally to pre-industrial levels. This would bring multiple benefits: The decay of the air belt protecting the planet against excessive warming by the sun would be slowed down and, in the best case scenario, prevented

altogether. The so-called over-acidification and warming of the oceans would be stopped and the marine fauna would have a chance of survival. Ideally, the less CO_2-polluted air would be able to compensate for the excessive CO_2 concentration of the oceans, so that their pH value would return to its initial equilibrium. The original and natural CO_2 cycle would be restored – all thanks to sensible human intervention.

Intervening in this self-destructive CO_2 cycle is necessary and has no alternative. Jacques Piccard describes this task fatalistically: «In the development of the planet, man is merely a tiny particle in eternity. If he does not manage to calm down, to stabilize himself, then he will disappear as a species from this planet. On the other hand, the sea will recover.» [6)]

* * *

1. Die *Trieste* ist ein sog. Bathyscaph, ein U-Boot für grösste Tiefen. Jacques Piccards Vater, Auguste Piccard, hatte die Bezeichnung aus *bathys* (griechisch: tief) und *skafos* (griechisch: Boot) gebildet. Ein Bathyscaph besteht aus drei Teilen: 1. Druckkugel für die Besatzung; 2. Schwimmkörper, mit dem der Abstieg geregelt wird; 3. abwurffähiger Ballast, der den Wiederaufstieg ermöglicht.
2. Die Expedition «Five Deep» erreichte am 28. April 2019 eine neue Rekordtiefe von 10'925 Meter.
3. Antenne, SRF, 9.1.1963
4. Methan, Distickstoffmonoxid, Fluorchlorwasserstoffe (FCKW), Schwefelhexafluorid, Stickstofftrifluorid. Zusammen mit CO_2 bilden sie die sogenannten «Treibhausgase».

[5, 6)] Jacques Piccard, Logbuch aus der Meerestiefe, Stuttgart, 1975.