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TO SAVE THE GLOBE – THE CHANGE IN CO₂ PARADIGM IS A MUST!

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Abstract: With the famous Kyoto Protocol (1997) the carbon-dioxide (CO₂) has been declared guilty. So far series of conferences cabled its reduction while by today even a carbon free vision got a serious political consent. In the meanwhile, climate change has been accelerating and escalating contradicting to those overall CO₂ reduction efforts. Increase of global warming with forest fires extension and ice melting are showing also an escalation. While the world air traffic has collapsed (due the COVID-19), atmospheric CO₂ level seems to be stabilizing at 400 PPM. We can simply declare that CO₂ theory does not work while we are running out of time! Let's turn the whole theory upside down. Take the CO₂ as a fertilizer (as it has always been) and start to create large green surfaces – carbon climate farms - with C4 species, agroforestry and geo-engineering while stopping the desertification or even turning it into profit center. Green Sahara and other large green projects completed with CO₂ fertilization could convert large amount of CO₂ into value with which progressive climate mitigation could start. Hungary inaugurated its first carbon climate farm in Nagyberény in 2019 while Morocco labelled our CO₂ open field fertilization pilot project as an important innovation at COP22 in 2016. We have tools for new efficient solutions, so let's convert CO₂ into green value.

Keywords: carbon-dioxide, ecology, history

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Strategic Energy Technology Development and Supplying Co

- Strategic deployment of energy technologies → leader in green technoligis. Activity focused on innovation, renewable energies, carbon-climate plantation and progressive climate mitigation
- Extended international relationships
- **Organizer of International Energy and Innovation Forums (17-27th), Sahara Scientists Summits (1-3rd)**

Cooperation with EU sponsored Climate-KIC program in biogas and
CO₂ recovery(2013)
↓
International engagement in Morocco (2015-2020)

Really the CO₂ is responsible for global warming?

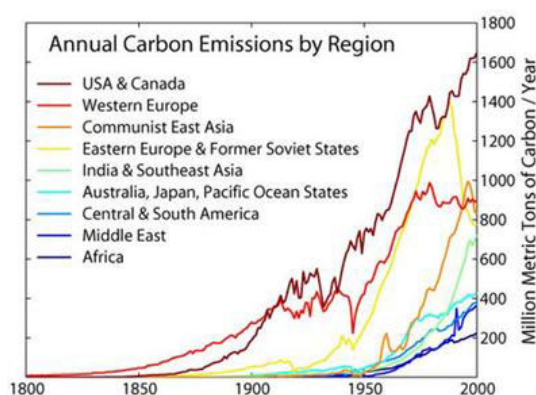
Facts

- ▶ Globe has always been having fluctuating climate and (relative) high CO₂ level
- ▶ Vegetation with intense photosynthesis capacity (C4) and extended green surface has been compensating temperature increase and decreased CO₂ level
- ▶ Shrinking CO₂ level (degradation of flora, majority of C3) with human activity (deforestation) development together have neutralised the Earth self defence capacity

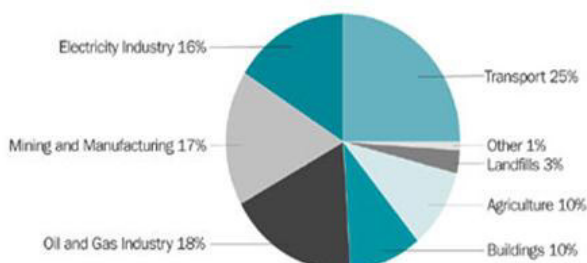
Trends

- ▶ CO₂ current level is low even for C3 type species while climate change is continuing to fluctuate
- ▶ Deforestation and desertification have even been accelerated, surface reflection has been growing
- ▶ C4 species could not efficiently contribute to climate change mitigation unless CO₂ fertilisation will be introduced

Increase in carbon dioxide emissions and structure

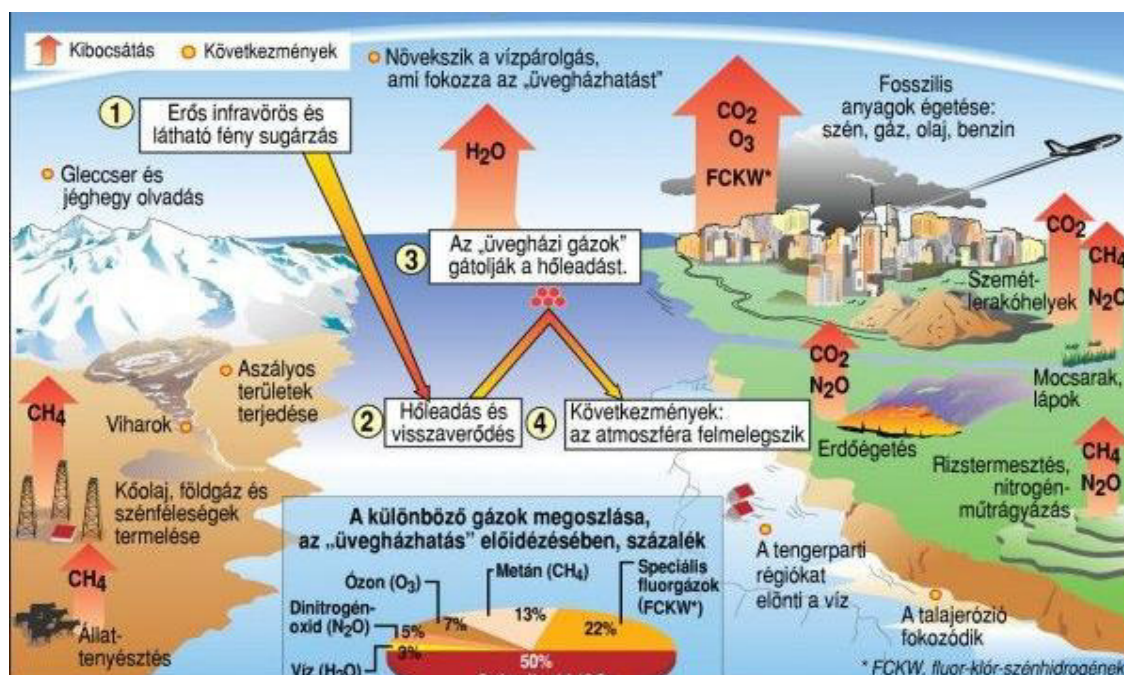


Greenhouse Gas Emissions by Sector, 2010



- In 2014 the carbon dioxide emissions growth per annum exceeded 3.2% and in total was 31.6 billion tons. By 2030 (at constant structure), an other increase of 40% expected from the transport

Greenhouse effect, for which the CO₂ is the main guilty

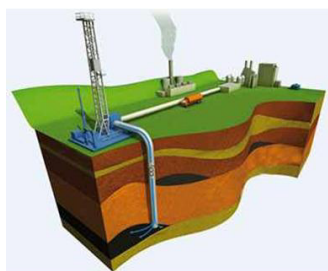


CO₂ History

- The amount of carbon dioxide is extremely and continuously varied in the atmosphere throughout the Earth's history
- We have had – not even once -higher than 1800 ppm level
- At the beginning of the industrial revolution it was as low as 280 ppm
- Today, it is reported to be in the range of 380-410 ppm

To measure the CO₂ concentration we are using an internationally accepted ppm units. The ppm is parts per million

Solution I.



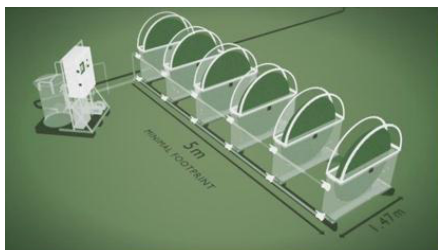
Storing CO₂ (CCS Carbon Capture and Storage)



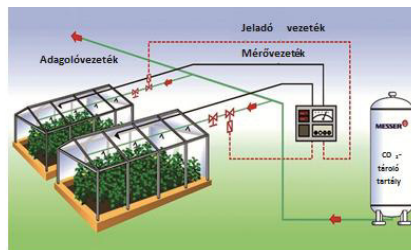
Sequestration of CO₂ through photosynthesis

CO₂ storage (CCS) could overbridge seasonal and geographical differences and boost carbon-climate farming all over the World

Solution II.



ALGADISK



CO₂ fertilization

Brilliant solutions to increase the added value, but not enough to absorb large amounts of carbon dioxide gas

Solution III.



CO₂ fertilisation on corn plantation



Symbiotic (coffee and tree) plantation

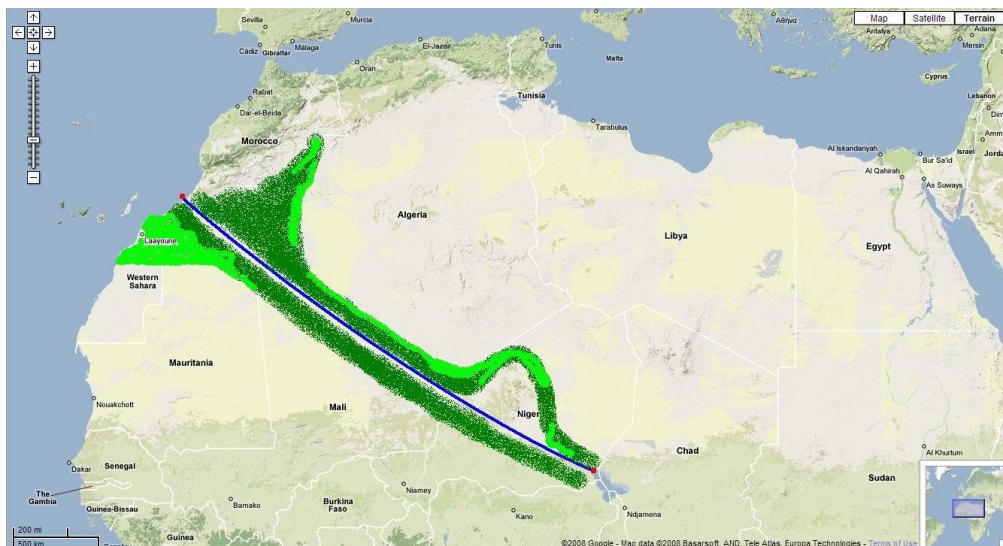
In a plantation or even in a symbiotic cultivation the level of CO₂ assimilation can be increased to 3-5

times and reach about 30 -200 tons / ha / year .Currently, the average CO₂ assimilation in Hungary is about 13.6 tons/ha/year.

CO₂ fertilization technology ave been modeled in Morocco (2016)

- The bottled commercial CO₂ was mixed with air and used in a 1600 ppm dilution
- The CO₂ trough a flexible pipeline was delivered to the plantation where the CO₂-air mix was injected in the crowns of the trees.
- The management of the process was controlled remotely by a software which allows to maintain an optimum condition (in accordance with the curve of CO₂ assimilation of the specific plant) continuously monitoring the humidity, temperature and light, measuring the intensity of illumination.
- With this method it was possible to increase the large scale absorption of CO₂ by 4-5 times(almost up to the maximum of C4 plants), while the cell mass (and yield of course) was increased by approximately 30%
- Above solution was labeled as an important innovation of COP22 (2016) Marrakech-Morocco!

CO₂ irrigation can be a tool to the Green Sahara project and key to the progressive climate mitigation



CO₂ irrigation can be a tool to the Green Sahara project and key to the progressive climate mitigation

- From 9 million km² of the Sahara Desert about one third can be rehabilitated by a symbiotic plantations, which use a C4 photosynthetic hibrid (Paulownia Smaragdafa) Thus we can transform about 4 billion tons of CO₂, while improving the supply of food and feedstock in the world
- Promoting eco-forests (C4 type trees for rehabilitation the rain forest) and the cultivation of trees in the unused, degraded areas is estimated to lead to the seizure of other 4 billion tons of CO₂, obtaining also as important materials as oxygen and wood besides other externalias.
- If the world on the 161 million hectares - which are used to grow corn - is to perform CO₂ irrigation technology ,too we could consume additional 1.61 billion tonnes of CO₂
- **Just from above solutions 10 billion tons a year of CO₂ can be converted into value trough a Progressive Climate Mitigation concept.**

Ecological paradigm shift?

- The reduction in CO₂ emissions by 2030, and carbon dioxide planned fertilisation together provide a new solution for humanity, which puts the emphasis on the CO₂ processing instead of placing additional restrictions on national economies;
 - The resulting amount of biomass would increase further the biogas and bio-to-liquid (BTL) technologies, further reducing the global amount of CO₂ produced by fossil fuels;
 - The evolving CO₂ pipeline systems generate extraordinary investment opportunities (strengthening the green economy) in agriculture while geo-engineering works also offer new investment occasions worldwide;
 - Carbon irrigation and related technologies are opening new dimension of industrial agriculture or in agro-forestry, where the carbon dioxide can become a useful raw material.
 - To provide a finance for a 10 ha pilot scale project with CO₂ fertilisation system and its innovative technologies in Agadir, Morocco
 - Expected budget: → 300.000 €
 - Duration 3 to 4 years
 - Engineers to be recruited 10 persons
 - Patenting and know-how control important!
 - International extension (Green Sahara or GW support): from the beginning
- Project will prove progressive climate mitigation as a workable solution with CO₂ fertilisation