



OUR-GREEN-SPINE

Serving food & water structures and **cooling** our Earth
by functional **greening** our society and restoring **nature**.

Why Our-Green-Spine (OGS)?

- Our-Green-Spine enables the **cooling** of Earth's Atmosphere and surface between 1,0^o C – 1,50^o C by finding leverage of nature's own processes of **cooling**, via green structures (plants & trees). The cooling is done through the function of evaporating **water** vapor!
- This substantial **cooling** is possible within a short lapse of time; 30-50 years.
- While strengthening the **cooling** capacity Our-Green-Spine, at the same time, removes and takes up massive quantities of CO2 effectively, making the blanket less thick or thinner which will limit the warming of the earth.
- Our-Green-Spines strengthens and enhances the **water** and food structures to make regions more resilient and self-supporting and reduce the need for people to leave their home countries.
- As a result Our-Green-Spine enables mankind to survive the potential climate threat's.

How will Our-Green-Spine do this?

OGS uses nature's own strength provided by effect-related green structures in order to restore Earth's Green Spine.

What is Our-Green-Spine?

OGS is a multidisciplinary discipline based on long term research on micro and macro climatic properties of plants/plantation/green structures. Our-Green-Spine relies on proven techniques & products.

Why do we need green structures?

Green structures (plants/trees) are an important part of the energy balance of the earth. Green structures stores the energy of the sun by creating biomass. In the same loop green structures creates shades which makes sure that earths' surface doesn't get to warm. By storing the energy through biomass green structures helps balancing the CO2 balance in the atmosphere.

There are two other functions that are at least as important. The first one is that plants/trees **cool** by evaporation of **water** while harvesting the for plants and trees indispensable CO2. The phase change of the produced **water** vapor on higher altitudes in Earths' atmosphere enables Earths' transmission of long wave radiation that is not absorbed by CO2 and therefore can leave the Earth directly. Green is the **ACTIVE air-conditioning** of the world!

The second important function is that a long chain of green structures from coast to coast realizes a long distance transport of water through the so called 'biotic pump'; distribution of water all over continents and therefore the for humanity indispensable replenishment of water sources/ground water.

Adding, on a large scale, new green structures will of course also start with a large scale reduction of CO2 emissions, making the CO2 blanket less thick. This thinning of the CO2 blanket can take a long time before it shows a tangible **cooling** effect. On the other hand green structures have an **IMMEDIATE** and decisive influence as the **active airco** and the **cooling** capacity of the Earth and the capability of managing radiation, wind/velocity and the water-cycle on earth's surface and atmosphere. This all is needed to safeguard earth's energy balance, the ability too **cool** earth's atmosphere and creating the necessary food structures which is crucial for our society.

*"It is hard to be **cool**, without being **green**."*

Gaia

(our **water** planet)

What can we learn from the past?

Paleo-Climatic Research shows how events of warming earth's atmosphere by deforestation triggered significant changes in climate patterns, for example human activities (cutting forests for agriculture, housing and energy) during the Roman Empire and the Middle Ages led to the medieval warm period. The plaque in Europe and Columbus discovering the America's (viruses) resulted in mass depopulation up to 40% (Europe) - 95% (the America's) and led to reforestation. The medieval warm period was followed by the so called 'little ice age'. (*Shortlist Sources: H.H. Lamb, William F. Ruddiman, Jed O. Kaplan et al.*)

Research shows also recent climate-changes due to deforestation. (*Shortlist Sources: Petra Hesslerová, Jan Pokorný/Gourdji et al.*). On the contrary geological research shows us how Devonian trees (400 million years ago) cooled down the Devonian climate and meantime absorbed 90% of the atmospheric CO₂.

Starting from Devonian times the evolutionary based climate moderating effect of plants/trees made earth habitable. Plants/trees created perfect conditions to stabilize climate and therefore were evolutionary "fit for purpose". Basically plants differ in their moderating function not from the species 400 million years ago but have become more effective in colonizing earths' surface until mankind started interrupting in evolutionary forces (by deforestation and recently together with emitting large quantities of CO₂) offsetting global warming processes. Mankind's strategy is certainly not an evolutionary successful strategy and laws of evolution teach us that non-successful evolutionary species tend to disappear.....

Green starts Cooling Immediately

Principles of Our-Green-Spine:

Plants properties & the Water-Cycle:

Water vapor evaporated by oceans is sucked in by tropical and boreal forests all over earths' continents by pressure differences in the atmosphere (large quantities of water vapor evaporated by the forests, exceeding the evaporation level of oceans, result in substantial lower continental air pressure and therefore suction of moisture from oceans); delivering the moistures where it's needed to establish sufficient moistened soils for plants/trees to grow and meet mankind's demand for fresh water resources. Trees add water vapor to the atmosphere by evaporation. The water vapor condenses to clouds cooling Earths Surface and providing indispensable precipitation.

Recent research on the biotic pump: Gorshkov/Makarieva (Petersburg Nuclear Physics Institute) and recent research (Source: Utrecht University) shows the decisive role of evaporation in cooling our atmosphere hence providing scientific evidence for OGS, hence underling the value of OGS.

Earth emits energy by condensation:

Clouds (like ice surfaces) reflects incoming radiations, but clouds also emits (outgoing) long-wave radiation as a result of phase-change processes; when water-vapor condenses, water molecules from high level (gas) transform into a low level (liquid). In this process water-molecules will release latent heat in the form of photons or phonons, the wave length of these photons passes the atmospheric window without being absorbed by CO₂, because the wave length doesn't match with the frequency of CO₂-molecules. (*Source: University of Shanghai¹ & Carnegie Institute²*).

Green is the airco, the refrigerator of the Earth. Let's face it we have ice on the poles (effect) because of green structures (cause). The North-pole is not the refrigerator, but the canary in the coalmine, and is as a mirror (the Albedo effect) an important passive cooling element in Earth's energy balance system.

OGS will enhance the evaporation-capacity and through this the cooling capacity of earth's surface and Earth's Atmosphere.

Adding cooling capacity by interacting green structures framed in a Spatial-Design Strategy:

Earths' green surface declines rapidly; already 70% of soils is degraded. Degenerated soils heat Earths' atmosphere by emitting long-wave radiation which is captured by CO₂-molecules and warms the CO₂

¹ Analysis of Cloud Droplets Growth and Phase Transition Radiation Process (Biao Zhanga; MingYan Zhub; ChunYu Wang; Xin Guan)

² https://www.youtube.com/watch?time_continue=13&v=HHDMKm4FXsw

blanket (as mentioned the radiation emitted by the condensation process of water passes through the CO₂-molecules). We have to preserve the strongest **cooling** capacities on Earth which means saving the tropical and boreal rain forests and regenerate wasted soils by adding interacting green structures else on the world. Adding interacting living areas (cities) and food production areas with artificial forest structures. (covering a relative low percentage of an area) meets largely the **cooling** and CO₂-sequestration abilities like 90% - 100% coverage by forests.

The Spatial-Design-Strategy of Our-Green-Spine:

The Spatial-Design-Strategy is effect-based, providing a 100% green-coverage-effect (without 100% spatial coverage) changing urban deserts/agricultural deserts/any natural desert area in to a green climate controlled areas. We need most likely 10-15 million km² of new functional green structures.

No need for Regional Rivalry - Make Green - Not War!

This simply means zero land-use losses for water-storage / food-production / transport / housing, as the same area can produce all the values which are needed without any environmental or ecological risks.

This means the opportunity to save the tropical and boreal forests indispensable to keep the biotic-pump functioning. For example instead of threatening each other with economic and military warfare Europe, Russia, China and their neighbors should work seamlessly together for radically greening their surfaces to establish an integral coast to coast green structure on their shared continent. By this way preservation of their forests, needed to provide mankind sufficient water supplies, is secured.

A new 'social inclusive' circular chain purpose driven green economy:

OGS creates a new social inclusive circular chain purpose driven green economy based on finding leverage by nature's own sources / care management of earth's resources. OGS is the ultimate opportunity for "Unlocking the inclusive growth story of the 21st century" as the content of OGS links seamless with "The New Climate Economy"-report of The Global Commission on Economy and Climate. [Link](#)

Cooling earth and enhancing the strength of our society at tremendously low costs:

Without making our society resilient and future proof a lot of capital is at stake. We estimate that OGS will only cost 0,25% - 1% percent per year of the expected losses on financial assets and general assets when nothing is done³, roughly 200 billion dollar a year⁴.

Time span:

We need a World War II like mobilization to save civilization, in that modus OGS could take 10 years to get accepted world-wide and could realize tangible world-wide **cooling** effects within a 30-50 years' time span and on a shorter horizon better water and food structures.

To emphasize exclusively on CO₂-emission reduction and CO₂ sequestration for **cooling** earth's atmosphere will take too much time (between hundreds to thousands of years) to obtain results.

Time lapse for starting up the first phase of OGS-operation is two to three years.

For a deeper view into the fascinating world of OGS: [Link Understanding OGS](#) and following pages.

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³ Economist, 2015, The cost of inaction: Recognising the value at risk from climate change; in a moderate scenario 18 trillion dollar and in an extreme scenario 56 trillion dollar.

⁴ 200 billion dollar a year is in the same range as what Lester Brown from The Earth Policy Institute calculated in his Plan B (<http://www.earth-policy.org/>).