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Introduction:

AIRvalue is a model approach to assign a monetary value to air[1] as the most widely used commodity. Everything that has a transparent value is more appreciated by us humans and thus better protected. The state of the atmosphere[2] is the primary variable[3] affecting the biosphere and life. Carbon dioxide[4] CO_2 in the carbon cycle is the central carrier element of photosynthesis and cellular respiration in plants and living beings. The Earth's carbon cycle is a natural and very dynamic exchange process at countless interfaces of the biosphere for nutrient supply and heat effect, similar to the bloodstream of living beings. Currently, this life-defining cycle has a increase of almost 50%

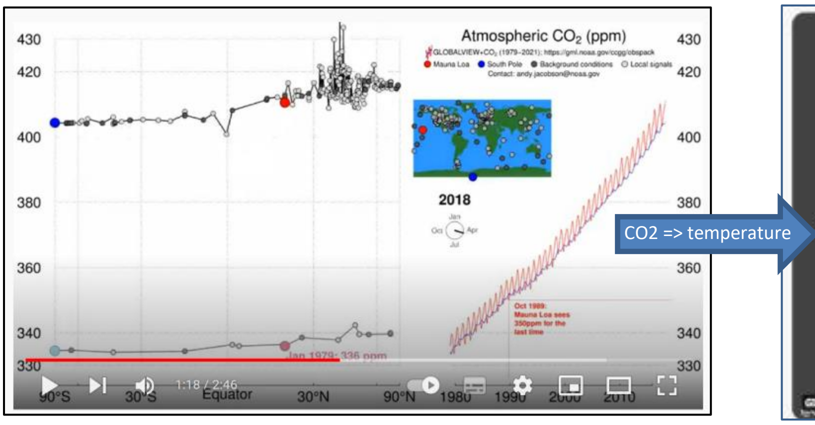


Fig.1: Video CO2 Keeling curves (NOAA)

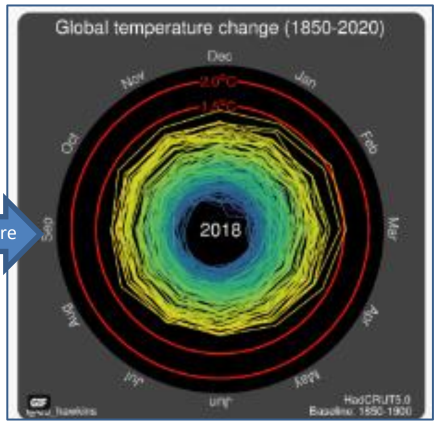


Abb.2: Video Temperature spiral E. Hawkin

due to human activities. CO_2 and water are energy-driven by sunlight - elixir of life[5] in the natural cycle with omnipresent interaction.

The concept evaluates the natural and man-made process in a ten-meter-high soil-adjacent air layer. This layer is defined as the basis for calculation and divided into house-sized, cube-like "AirHus" (Air-Unit or Air-Cube) with an edge length of ten meters. The floor area measures 100 m^2 and the volume 1000 cubic meters as in a multi-storey house. The process in the approximately 100 km high air column "AirCol" (AirColumn) above and the carbon cycles[6] in the soil or water below is attributed to the base cube AirHus.

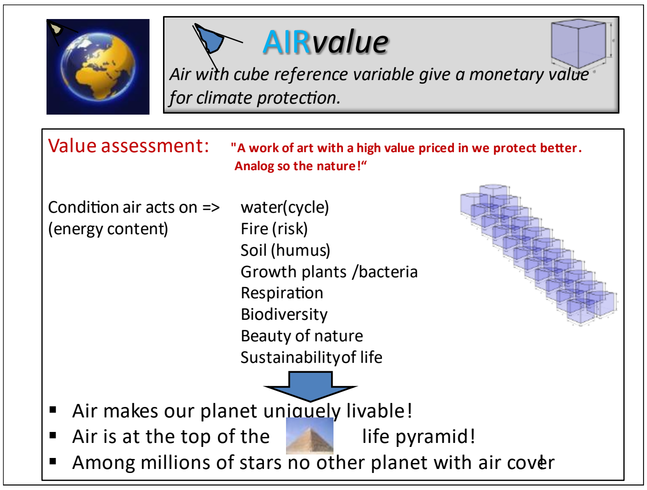


Abb.3 AIRvalue <> Air state

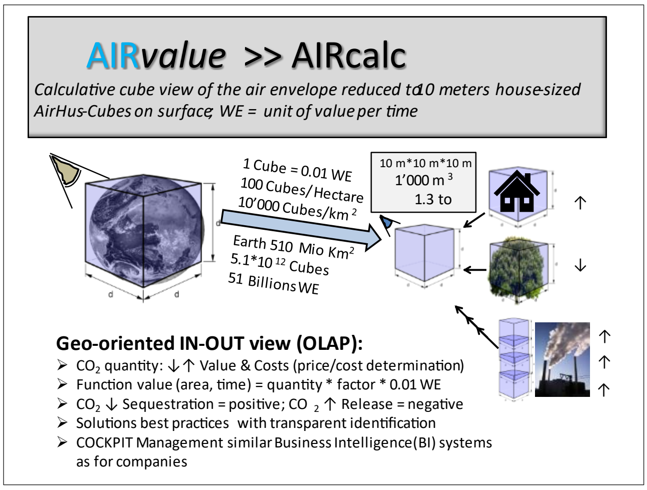


Abb.4 AIRvalue <> AIRcalc

Natural exchange processes of energy and substances take place at interfaces and this is causally the earth's surface. Photosynthesis[7] is the crucial natural process with CO_2 uptake for biomass build-up and O_2 release. The rapid reduction and repatriation of the climate-damaging CO_2 surplus and other greenhouse gases is vital for the future. The processes of nature[8] are calculated in a similar way as is the case in real companies. Similar principles are put into analogy and process results are evaluated by pricing. The excessive release of CO_2 into the air envelope by our human activities is cost-burdened by certificates[9], as it is misused as a landfill. With the dual strategy of preserving untouched nature (ecological nature reserves, economic balance sheet reserves) and improving polluted areas towards higher CO_2 integration, so-called "identificates" are to be compared with the certificates. The CO_2-absorbing systems receive monetary values, quantitatively and price-finding. Identificates are natural or technical systems that have a balancing effect on the state of the air through recycling. These can be combined with impact investments and are intended to facilitate a society-wide allocation for the protection and improvement of defined areas[10]. The urgent reduction of the release of CO_2 is intended to become a business model that unites peoples in a socially and socially just way, replacing negative processes with sustainable processes.

1. Atmosphere and relations

Our atmosphere[11] has a unique selling point throughout space and is the unique result of a biological evolution linked to earth history. Air is the connecting element from the cells of vegetation[12] and living beings to space. The viable air envelope is as thin as a skin and similarly sensitive. It is as low as a short Sunday walk is long. If an A4 printer paper is held perpendicular to the short side of a lying sheet, the thickness to the sheet length corresponds to

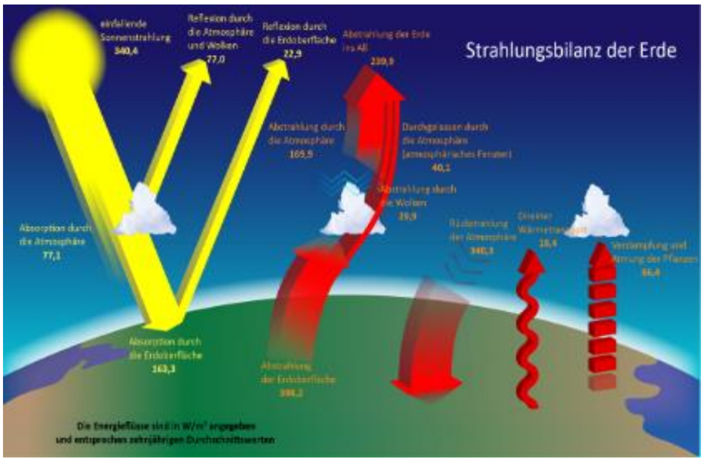


Abb.5 Radiation balance of the earth[13] (ETHZ)

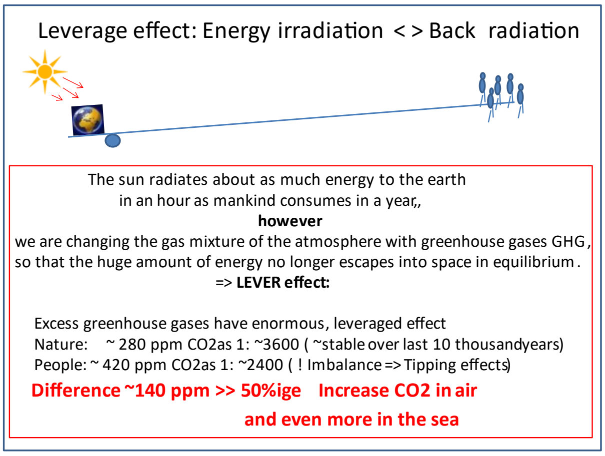


Abb.6 Leverage effect sun <> CO2

the approximate viable air layer (~4.2 km) with the main weather event. Three sheets of 0.1mm each illustrate the altitude of international air traffic and at less than 5 thick (19 km) our blood without a pressure suit would start to boil because of the low air pressure. The atmosphere is the filtering protective shell and regulates the infrared reflection of solar energy, which is about ten thousand times greater[14] than human energy consumption when it hits the outer layer of the atmosphere. At noon, the sun radiates as much energy to earth as humanity consumes in a year. On the one hand, this shows the potential of large-scale solar energy generation at suitable locations[15] in the world, as well as the risc potential of shifting the equilibrium in the Earth's radiation balance. With man-made air pollution, we change the filter effect of the air envelope in dangerous leverage, similar to turning a thermostat. Our actions have a global impact on the organism Earth, like cigarette smoke on the lungs. Over hundreds of thousands of years, nature has succeeded in keeping the CO_2 concentration and the average earth temperature, which are important for plant growth, largely stable despite many disturbing effects. She managed to do this until anthropogenic change. Today she is overwhelmed.

The weight of an AirCol air column at sea level with extension into space exerts a pressure of an atmosphere (1 at) or the back pressure of a 10 meter high water column or 1 kg per cm^2. Overall, an AirHus air column above the identical base area weighs as much as the ten-meter-high AirHus base cube full of water or one million kilograms. The compressed weight-related consideration of the components of the air on an AirHus cube facilitates the pictorial comparison of the active variables. The homogeneously distributed CO_2 as well as the carbon monoxide in the stratosphere and the water vapour of the clouds essentially stabilize the earth's temperature in natural concentrations. The numerous vital carbon cycles of photosynthesis, respiration[16], gas exchange[17] with the oceans and biomass build-up depend on CO_2. The weight fraction of CO_2 as the heaviest molecule in the air mixture (factor 1.52 wt.% to vol.%) is 630 kg (415 ppm vol-%; Year 2020) a proportional pressure of 6.3 mm in the 10 m water column. Over thousands of years until the beginning of industrialization, this value was ~4.2 mm (280 ppm vol-%). If you place a DIN A4 sheet on the 100 m2 base area of an AirHus and fold it three times, then the weight of the air column corresponds over two thirds (420 cm2 / 420 kg) to the CO_2 target value (280ppm) of nature and over the entire leaf area with~ 630 cm2 or 630 kg the weight of the anthropogenic and 'inflationary' excessive CO_2 content. There would be room for 1600 sheets on the entire floor area. Is the figuratively condensed weight fraction of 420 kg/AirHus in principle analogy between economy and ecology the gold standard of nature, then the other is the unregulated and chaos-oriented slide into an uncertain future with the urgent need for countermeasures. In the figure of the 100 m2 base area, a single field corresponds to the 10,000th part or 100 ppm.

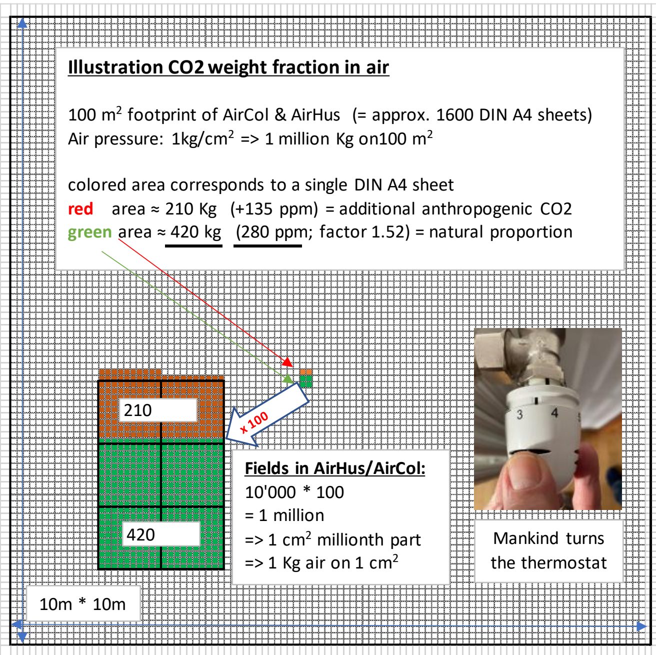


Abb. 7 AirHus Area in relation to CO_2

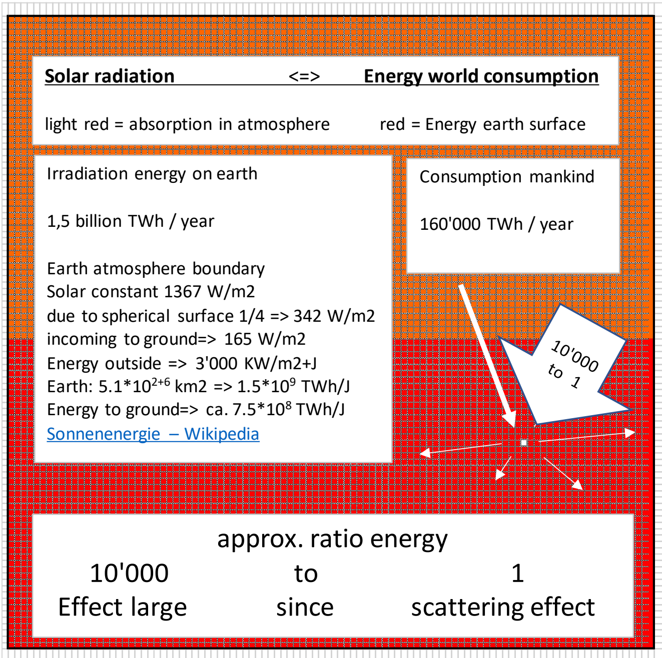
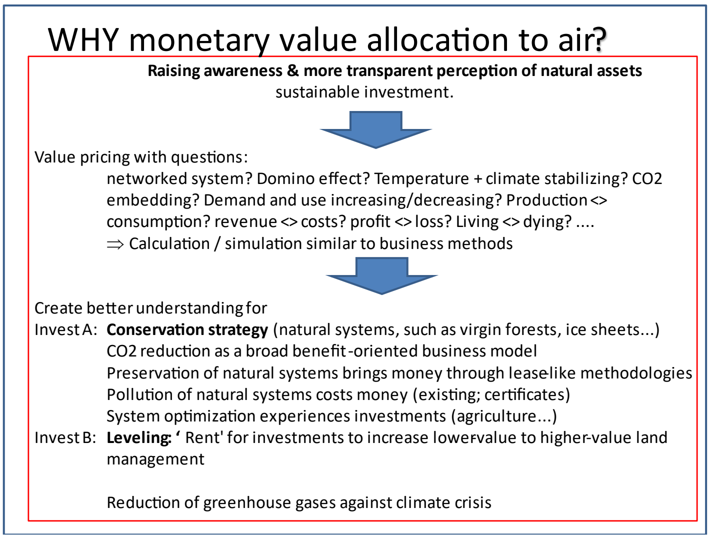


Abb. 8 Solar radiation <> Weltenergieverbrauch

The vertical visualisation can be contrasted with a horizontal one as a layer. Since time immemorial, the gaseous CO_2 calculated in solid form weighed about as much as a comparable plastic roof of a modern greenhouse, to put this in relation. In the atmosphere itself, carbon dioxide is homogeneously distributed by convection currents and entropy. This thickness, illustrated as a condensed form, has been increased in half by human activities in the atmosphere, in addition to the much larger part that the sea and vegetation have taken up in addition mainly in recent decades and continue to absorb up to a foreseeable threshold.

The effect of CO_2 as a greenhouse gas[18] and as a carrier of the carbon and oxygen cycle[19] in the photosynthesis process made life possible in the first place. The ever-increasing CO_2 concentration caused by human activities drives the temperature dangerously, as do the other greenhouse gases methane[20], nitrous oxide and the associated increased water vapour in the air with a strong temperature-induced greenhouse effect. Just as too much food is bad for you, too much CO_2 is just as dangerous. Nature senses their concentration at the cellular level with the natural CO_2 receptors[21]]. It reacts with increased vegetative growth, changes in flow conditions and foreseeable organ failure in the sea, similar to the reaction of cells in our body to interference. Over long periods of human history, it has managed to equalize an almost stable CO_2 concentration range around 280 ppm despite disturbing effects. Every year, we bring this balance into the critical red turbo range by almost one percent. The organism earth becomes a medical emergency, similar to the human body, when the temperature rises by two or more degrees. At the poles it is already in the beginning lethal range for ice and animals and in our latitudes for insects and small organisms.

It is the aim of the **AIRvalue** concept to contrast the load-oriented view of our air with a value-oriented productive view based on the processes of nature. Nature works in a similar way to a company. Their performance can be evaluated, on the one hand quantitatively as a CO_2 sequestration performance, and on the other hand in a measured way, as in the pricing of products in the real economy. The AIRvalue concept is based on the **house-sized** base cube AirHus of 10*10*10 meters at ground level. It measures 1000 m3. The air inside an AirHus weighs 1.3 tons and the entire AirCol air column above its footprint 1,000 tons or as much as the AirHus cube full of water or as much as a 1.3 meter high iron block.



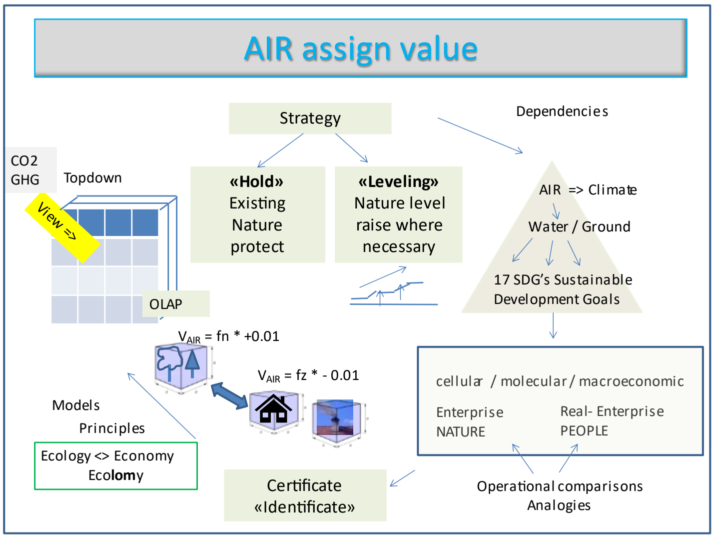


Abb. 9 WHY monetary allocation to air?

Abb. 10 AIR Strategy and dependencies

The cube is a geometric reference volume, but also an intuitive methodology in economics for the multidimensional analysis of complex relationships. Processes take place largely at boundaries or surfaces near the ground. The process action in the AirCol air column or below in the soil or water is attributed to the base cube by means of a levy factor. The earth's surface is divided into a geocoded network or grid of such cubes. Process values for CO_2 integration or delivery as well as value comparisons with certificate costs can be determined approximately top-down and vice versa bottom-up for natural and man-made processes. The rough scheme is similar to the division into GIS areas (geo-information system) with average values and refinement in deeper levels. Zooming into the detailed process as with mapping programs increases transparency and understanding of the underlying processes. With the formula "turnover = quantity * price" as in a real company, the production value of natural CO_2 recycling and anthropogenic pollution processes is to be evaluated. Quantity is a quantitative value, price determination is a question of willingness to pay or price determination[22]. This is largely the same for the NATUR company as for the REAL company with a changing market.

Natural processes are mostly positive in terms of air, anthropogenic processes are mostly negative. The price is composed of the factor f multiplied by a base price per cube. In sustainable nature, supply and demand in the cycle balance each other, no longer with the CO_2 supersaturation caused by our human influence. Furthermore, the aim is to derive entrepreneurial and economically oriented solutions - for example in the form of impact investments[23] -

from the evaluation of natural production performance in order to make an important contribution to solving the urgent tasks. The concept aims at two main directions, firstly, preservation of process occurrence worthy of protection in pristine or natural AirHus areas such as forests, peatlands, marine areas, and secondly, improvement of the human impact in AirHus Units that are not in harmony with nature. The huge task of mankind to stabilize resp. to return the CO_2 balance and further polluting greenhouse gases GHG like CH_4 and N_2O in the atmosphere is one thing, the renaturation[24] of the nature-appropriate humus soil and the oceans with the vital phytoplankton[25] the other.

2. Production value of nature ⬄ anthropogenic load view

The sustainable life-sustaining protection of the air envelope is a broad joint task that offers not only burdens but also economic opportunities that promote acceptance. Reducing CO_2[26] is becoming an important, benefit-oriented business model. The air envelope of 78% nitrogen, 21% oxygen[27], 1% trace gases and from a low but very climate-effective proportion of CO_2 is the connecting medium between space and the innermost part of all life.

Nature with the air envelope that flows around everything is conceptually evaluated as an ecologically and economically optimal circular enterprise according to methods of the real economy. The focus is primarily on the greenhouse gas CO_2, the proportion of which in the air is increasing more and more as a result of human action and has a risky influence on the climate. CO_2 vibrates in the spectral range of the heat rays returned from the Earth's

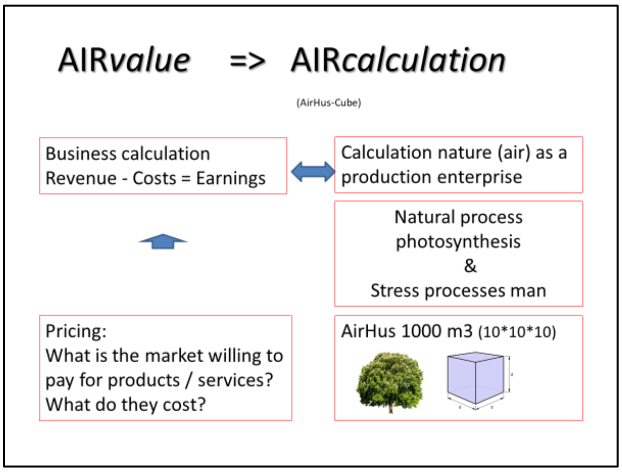


Abb. 11 AIRvalue => AIRcalculation

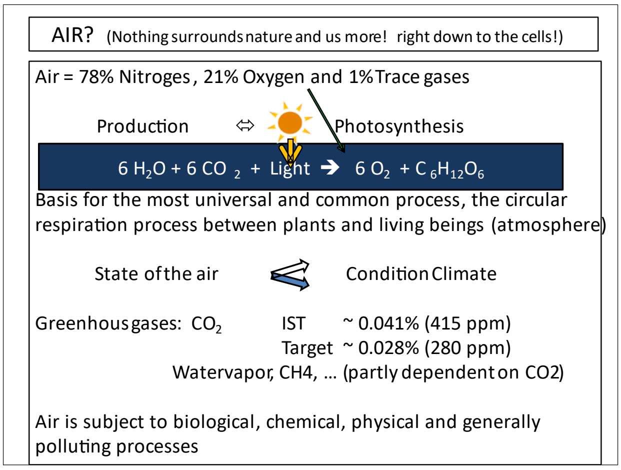


Abb. 12 Air surrounds us

surface and absorbs them strongly. The division of the ground-level air layer into AirHus standard cubes is similar to the division of workplaces into cost centers of economic production units. The concept uses calculative cube techniques (OLAP[28] online analytical processing) as they are used in companies in the real economy. Like the physical reference unit, this matrix technique is cube-oriented and enables intuitive zooming into condensed data sets down to the last detail, including natural CO_2 binding processes and man-made release processes of greenhouse gases. Drilling down from big to detail is like opening Explorer files. The Cube technique can also be applied in a similar methodological way to the screening of questions and best-practice problem solving. The load-oriented CO_2 certificates with annual reduction of the allotted quota size are to be countered by solution-oriented 'identificates' of conscious and broad commitment to the sustainable adaptation of our activities or offset against these. Reducing the release of CO_2 through efficiency and new technologies must go hand in hand with the fixing of the CO_2 that is too much in the atmosphere with natural photosynthetic and technically absorbing processes. Leading countries and societies, which realize this in a socially just way, create an exemplary role model for others as well as economic advantages.

We know the costs for fresh water and for the delivery of waste water. Both cost about the same. The formation of air and especially of the oxygen content was a mystery for mankind for a long time, because it takes place in the cellular. The question of how we humans pollute the air and consequently nature with our footprint and what we necessarily have to do about it, we hear more often than the question of the comprehensive value of the air. Both, the pollution view and the valuation view have the goal to improve the condition of the air in order to keep nature sustainably in a naturally balanced equilibrium. If we assign a monetary value to the process system of air only in hints, it becomes obvious what loss we accept unconsciously through stressful human action. At the same time, it becomes clear what value the preservation of intact natural systems has. Living nature has a higher value than black gold in the form of fossil fuels inside the soil.

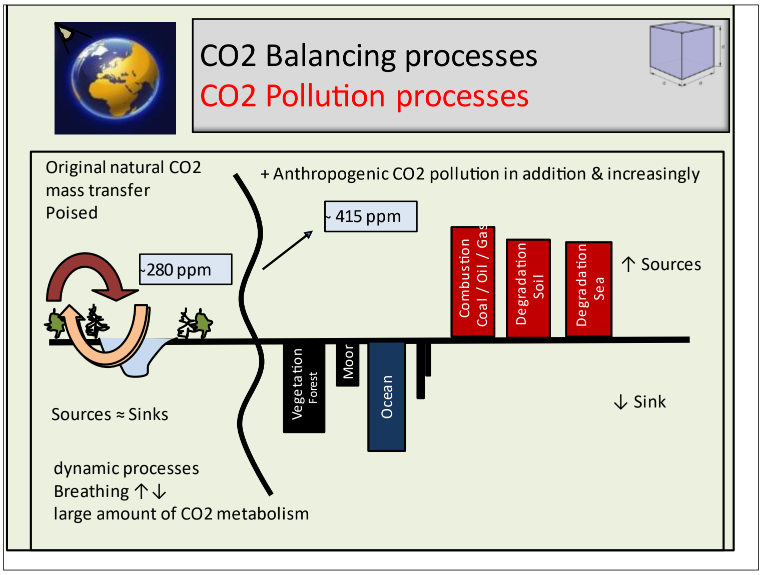


Abb.13 CO_2 Balancing -/ Pollution processes

Our common air envelope is the most comprehensive and worthy of protection common property of nature and all living beings. We breathe in and out about 15,000 times a day and the counter-rotating photosynthesis of nature with the integration of CO_2 and release of oxygen forms the recycling counterpart of the process equation. So it is in the whole biosphere and everywhere in nature. The video from NOAA[29] (National Oceanic and Atmospheric Administration, US) shows the seasonal ups and downs of the global CO_2 concentration in continuous upward trend like a pulsating breathing of the atmosphere. This is also measurable in the day and night cycle. We swim in the air like the fish in the water, only it is a thousand times lighter. It is our **commonAIR.** The calculation model **AirValue** understands nature and in particular air as a universal production medium.

If one speaks in common parlance of air value, then the word part 'value' refers to measured values as a measure of the pollution of the air with pollutants. The air as the production **value** of nature in the dimensions of space, function and time does not open up immediately. Processes in cells with self-regulatory functionality take place millions of times and continuously in the smallest units of time, in the human body alike in nature. It is a calculative question of valuation and pricing that makes a statement about what must be worth the air to us humans. Nature itself would not need pricing. It is coordinated in itself.

Pricing touches on many scientific areas. It is an assumption-based, predictive and time-dependent assessment method that adapts to advancing climate change, but which does justice to the general recognition that 'what has value is more appreciated'. With the aim of monetary value allocation, the urgently needed protection of the air is to be made more transparent and conscious. It is intended to increase identification with the production values of nature. We have no greater need for anything than pure, temperature-stable air. In vast space, no other planet with an air envelope has yet been found, which makes the uniqueness of this nature-created air envelope obvious.

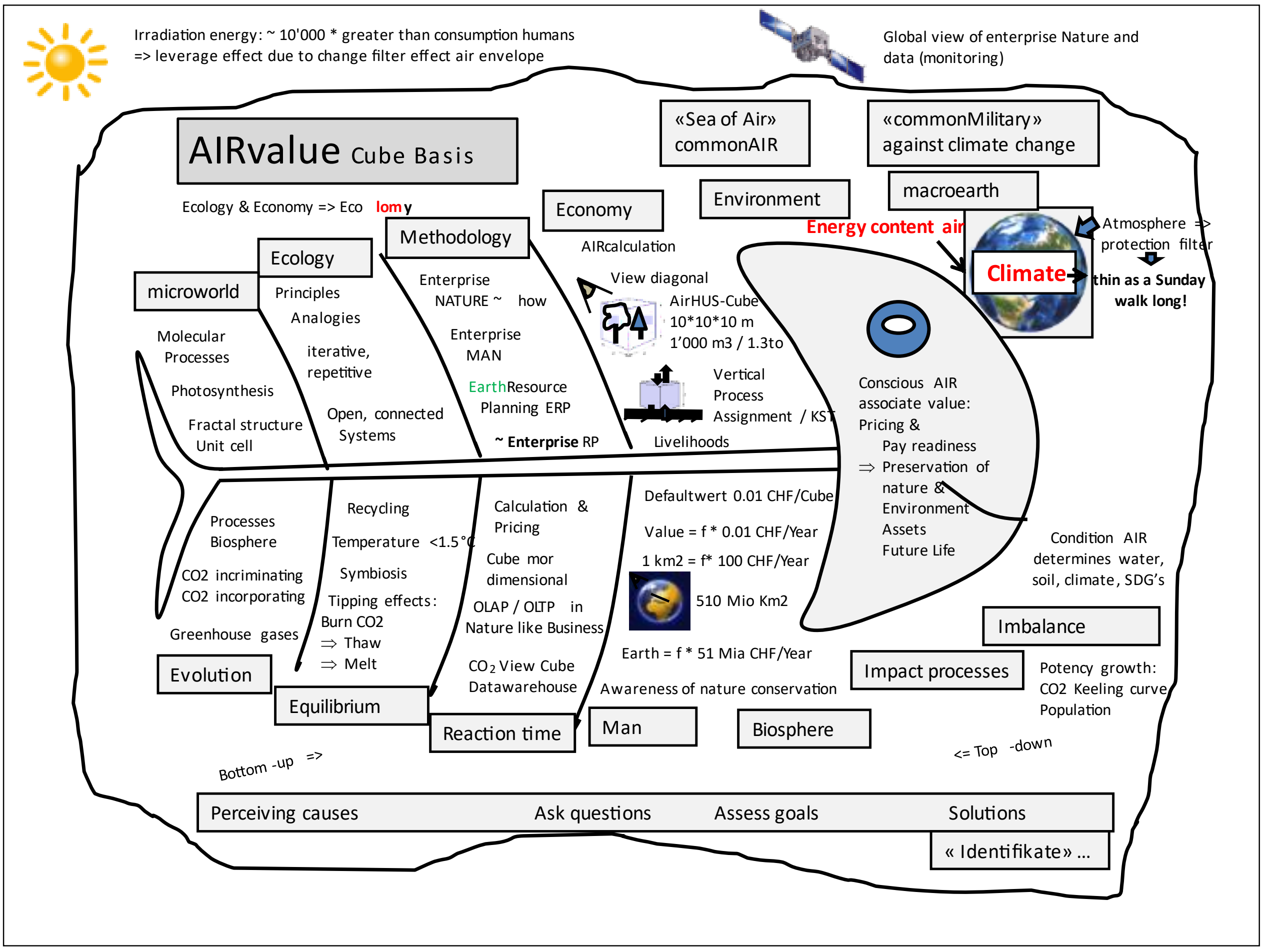


Abb. 14 AIRvalue Interrelationships and dependencies

3. AirCol column => AirHus Cube => AirGrid display method

AirCol is the total air column over 100 square meters. AirHus is the basic cube over the same base area for the illustrative calculation of the weight fractions and effective functions and AirGrid is the geocoded global presentation. The volume-based AIRvalue concept assigns a positive or negative effect or function value to the AirHus Cube depending on the processes taking place herein. The processes of nature are mostly positive from a sustainable point of view, anthropogenic often negative. The processes run transactionally in intermediate steps towards a final production value as a product or service. This applies to nature as well as to economics. Supplementary process services in the column above and below such a 1,000 cubic meter AirHus Cube are assigned to it as in an operational cost center accounting.

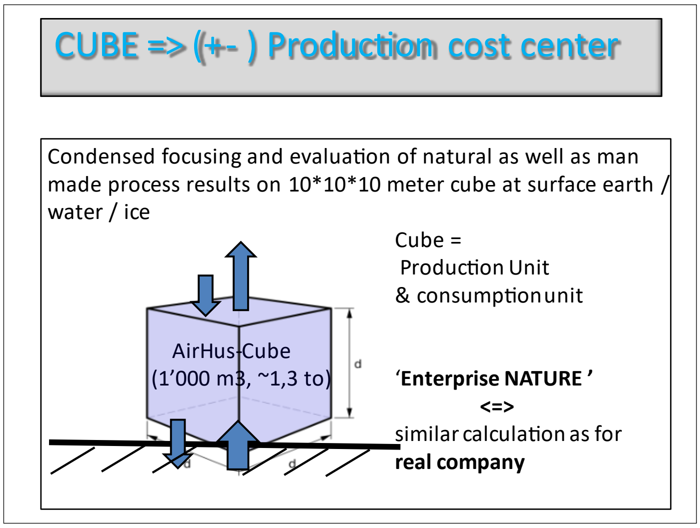


Abb.15 Cube => Production cost center

The Earth with 510 million square kilometers and 10^4 AirHus Units/km2 comprises a network of $5.1*10^{2+6+4=12}$ (=5.1 trillion) AirHus Cubes. If the annual production value within a cube were only 0.01 units of value (WE ≈ CHF, Euro, $...) then this would result in 51 billion units of value globally. A unit of value could also be defined as a nature value. We humans release about 36 billion tons of CO_2 annually by burning fossil fuels. If each tonne of CO_2↑ released or deposited anthropogenically in the air envelope cost around 1.45 WE, the same cost contribution of 51 billion WE worldwide or 0.01 CHF per AirHus per year would result. The annual production yield of a natural AirHus unit, be it through the action of plants or biodiversity in the sea or only through the albedo[30] effect, is much higher. At COP26[31] in Glasgow, costs of a hundred times higher were mentioned, which in turn means a comparable natural production value of 100 WE or 1 CHF per AirHus per year. The Amazon with 5 million km2 would have a CO_2 value of 500 million at 0.01 WE and correspondingly more at a higher valuation per AirHus and year. These are fictitious value assessments for the CO_2 integration potential with simultaneous O_2 release and many other positive effects. The determination of the real CO_2 sequestration potential is a demanding task, which is carried out terrestrial and via modern observation satellites.

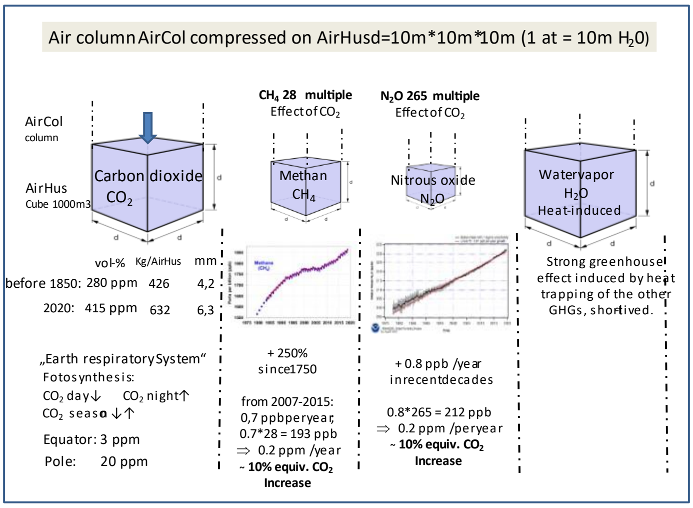


Fig.16 theoretical air column GHG

The intact nature needs untouchedness for its full functionality. It only needs our financial resources conditionally. Their protection costs money for the achievement of a long-term secured legal preservation in lease or similar legal form, and on the other hand for the permanent enforcement and monitoring of stocks. About 3/4 of the money to be spent would have to be invested in joint, profit-generating, nature-friendly projects, if possible on site in the vicinity of the protected areas. This in cooperation with the local inhabitants, the state or the landowners. The preservation of our nature is the greatest benefit and the most valuable heritage for future generations. Ecological benefits and economy are two sides of the same coin and belong together. Combined, this should lead to a rapidly growing benefit-oriented ecological economic transformation[32] knowing of the Planetary boundaries.

Air is the most widely used commodity that we humans have at our disposal without restriction. It is at the top of the demand pyramid and everything elementary depends on it as in a 1:n dependency. Air is the clockwork of nature, climate is the pointer. Air and especially CO_2 acts in the organism earth similar to blood in our body. It transports energy like metabolic products and nourishes the cells. Solar energy transformation is coupled to metabolism and release products which are in a similar way required in the process flow of photosynthesis and biological cell metabolism circulatory. Many other cycles depend on this. In the circular respiration process, it brings CO_2 to the plant respiratory cells and the oxygen released in photosynthesis to the cells of living beings. This is a duality like a formula with equal signs. It is consistent when there is balanced equality or at least a differential rapprochement.

The ecosystem, like our body, has long been able to create stable and life-appropriate temperatures and to maintain them until modern times. In the organism nature, in the stomata of the leaves, there is a sensory cell functionality[33] as in our body for regulating action on deviations. Many plants grow disproportionately with an increase in CO_2 concentration, but for how long? The current situation of the atmosphere shows a dangerous drift apart due to human, non-nature-adapted activities.

The economy of nature is an ecological model of recycling[34]. Business and calculative methods of business management can be adapted to nature in order to better understand, protect and learn from it. Out of the air, we humans have valued almost all goods in money. Through monetization, the air can be assigned a transparent value for its increased protection.

4. CO_2 material flow:

At sea level, the air pressure is 1 atmosphere (1 at ≈ 1 bar ≈ 1 kg/cm2). The word atmosphere refers to air both as a voluminous envelope of air and as pressure. Globally, the atmosphere weighs as much as a 10 meter high water envelope or $5.1*10^{15}$ tons . The individual elements of the air are measured in vol-% or ppm. However, the weight of the elements is less or greater than the average molar weight of dry air of 28.9 g/mol. If one assigns the proportional pressures of the individual components of the air to the 10m water column, then the layer thickness of the theoretically demixed nitrogen measures 7.8 meters, oxygen 2.1 m, argon 9 centimeters and CO_2 converted into weight percent 6.3 millimeters, which corresponds to 415 ppm (year 2020) in volume percent. Since CO_2 with 44 gr/mol is heavier than the molecular weight of dry air of 28.9 gr/mol, the weight of the CO_2 layer is calculated with a factor of 1.52 (44/28.9) to 0.0632 wt.% or 632 kg per AirHus or 6.3 kg over a 1 meter base area. Over one square kilometer, this results in a mass of 6.3 million kg.

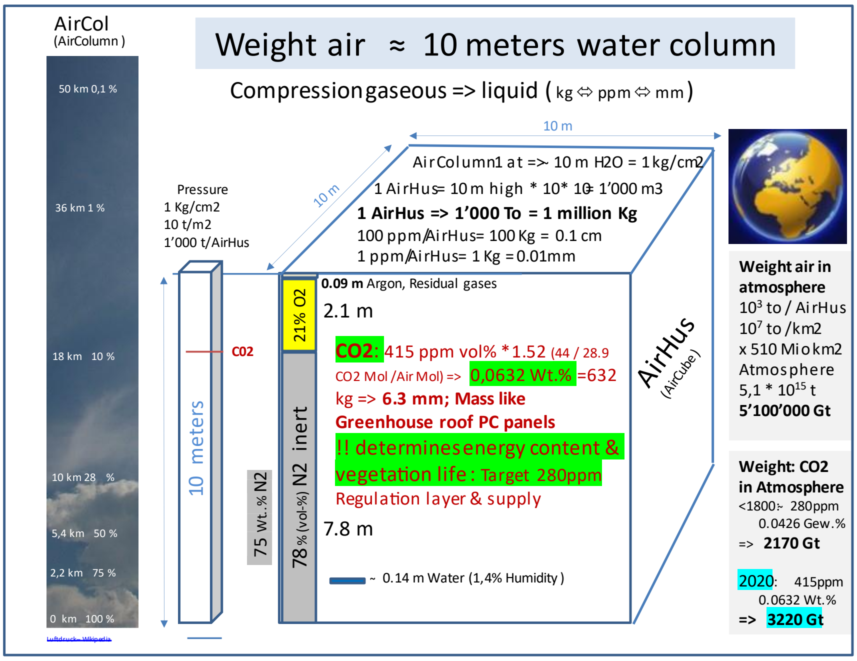


Abb.17 AirHus Cube / AirCol

The seemingly small proportion of CO_2 in the air causes the natural and anthropogenic greenhouse effect through the reflection of long-wave heat rays, but also the life-determining photosynthesis in the ecosystem. Within about 150 years and especially in recent deca7des, the CO_2 content worldwide[35] in each AirCol increased by plus 206 kg

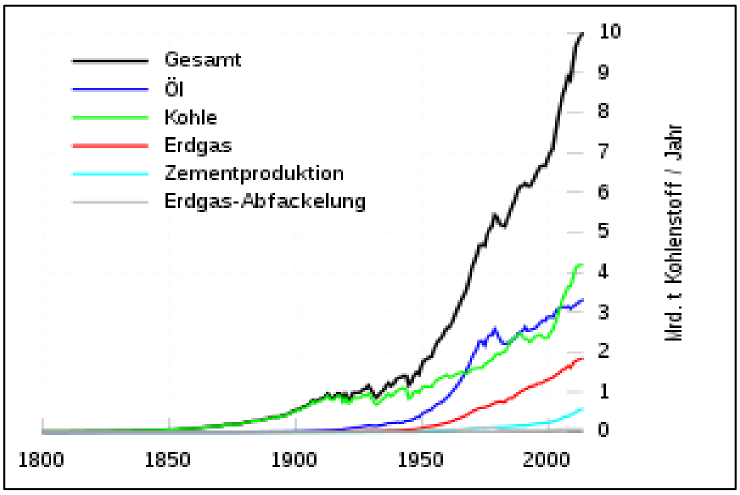


Abb.18 Gt Carbon in atmosphere[77]

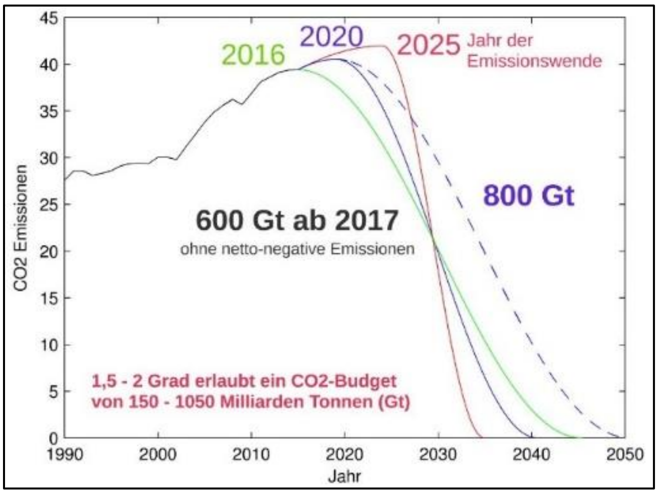


Abb.19 Gt Carbon load limits[78]

(+48%). In addition to the CO_2 pollution, the equivalent effects of the other greenhouse gases and thereby induced further water vapour in the form of clouds are added.

The annual global CO_2 pollution of the air envelope due to the release of around 10 gigatons of hydrocarbons increases to 36 gigatons (36 trillion kg) due to the increase in weight when combined with oxygen . With 510 million square kilometers, the earth comprises 5.1 trillion AirHus and just as many AirCol air columns. For each AirCol, this results in 36/5.1 or around 7 kg of additional CO_2 from man-made releases per year. CO_2 has a very long residence time of about 100 years and does not rain out like water vapor, which is itself a powerful greenhouse gas.

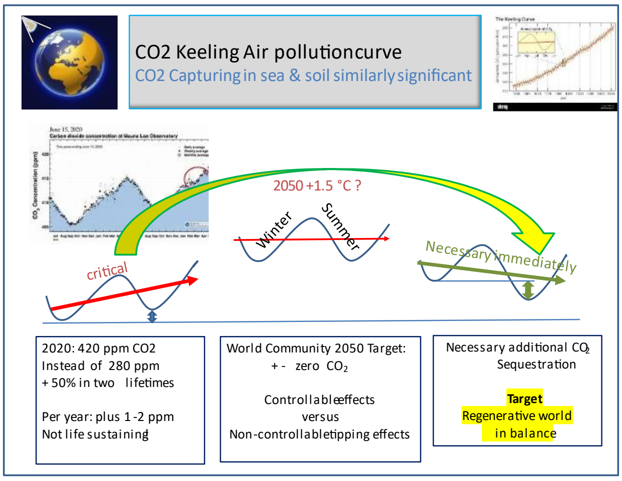


Abb.20 Keeling Curve

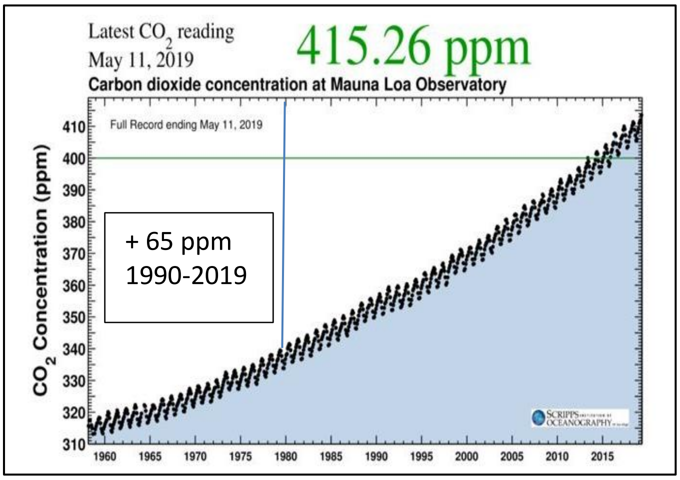


Abb.21 Keeling Curve from 1960 to 2019

In the last 30 years, CO_2 pollution according to the Keeling curve[36] has risen from 350 ppm (1990) to 415 ppm (2019). These are spread over the whole earth more than 2 ppm per year or as a weight fraction about 3 kg of CO_2 for each AirCol. This additional amount can be converted into additional energetic wattage per square meter. The material flow from fossil combustion would result in around 7ppm ($36*10^{12}$ kg CO_2 /$5.1*10^{12}$ AirHus) increase in the air envelope. Only about one third to half of the anthropogenically released CO_2 remains in the air, the larger proportion is absorbed by the sea and the ecosystem on land. The difference results from the ongoing storage of CO_2 with harmful effects in the oceans and the over-fertilization of nature with biomass build-up[37]. The natural CO_2 exchange in the many dynamic material cycles of nature is much greater than the anthropogenic share, but the natural cycles are balanced and the man-made CO_2 output from the burning of fossil resources as well as from the soil degradation by industrialized agriculture is not.

3 kg per AirCol seems little, but acts like an annual annual increase in thickness of a hypothetical Greenhouse film of 0.03 mm (3 kg per 100m2 or 30 tons per km2) anywhere on earth. The approximately 3 kg of CO_2 weight added annually per AirCol air column is offset by around 4 kg of CO_2 absorbed by the oceans and vegetation. Since the huge irradiation energy of the sun must be radiated back into space in a balancing way, any additional CO_2 load has a noticeable temperature-increasing effect similar to an increase in thickness of a plastic roof in a garden greenhouse with an additional stretch film. A theoretical conversion of the private release of CO_2 as the fictitious incorporation of a thin 0.01 mm film into the atmosphere, as we know it for wrapping food in the household, can make the responsible co-cause of each individual more vivid. A daily journey of 10 km with a very economical car causes the release of around 1 kg of CO_2 or the unwinding of a one-meter-wide and hundred-meter-long film of thickness 0.01 millimeters, the damage effect of which is largely externalized by the global air circulation into deserted areas.

AirHus as a basic cube and AirCol as a pillar are reference volumes that bring the assignment of ppm load and Kg CO_2 emissions into clear size ratios. Percentages and ppm parts-per-million can be displayed as volumes or layer thicknesses in meters or millimeters above the height of an AirHus. Thus, 1 ppm corresponds to one liter in the 1,000 m3 volume of an AirHus or a layer thickness of 10 my or 0.01 millimeters. Vertically, 1 ppm in an AirHus Cube corresponds to a 1cm2 column of 10 meters in height.

On a global average, a person consumes 1.3 tons of hydrocarbons annually for heating, cooling, mobility and their product and life needs. It thus produces around 4.7 t of CO_2[38] or around 7 kg (4700 kg/ 650 AirHus) per 650 AirHus units ($5.1*10^{12}$AirHus/$7.8*10^9$ people), which are calculated globally per capita over land, ice and sea. In the EU with 27 countries, CO_2 emissions in 2019 were around 8.1 t[39] per capita. Here, the exposure values were correspondingly higher and lower in countries with low-threshold emissions. If the air were a standing mass and the source emissions were not blown away to huge uninhabited continents, then some countries would probably be uninhabitable. The question of externalization of pollution costs and their responsibility as well as, conversely, the

Conversion CO_2 release to AirHus respective AirCol Units

a) vertical : 1cm^2 rods Fe resp. H_2O b) horizontal : m^2 stretch film 0.01mm

Legend:	1 ppm CO_2 (vol.%) in air corresponds 1,52 kg CO_2 (Wt.%)
	Theor. Air compression of AirCol Column on AirHus volume (Weight = 100 m^2 * 10m H_2O or 100 m^2 * 1,3 m Iron)
	worldwide 650 AirHus per capita ($5100 * 10^9 / 7.8 * 10^9$)
	AirCol: 1 mio Kg air <=> 1 Mio cm2 => Number rods on 1 cm2: 1 mio H2O à 10m <=> 1 Mio Ironrods à 1.3m

CO_2 ⇧	CO2 Release Condensed to Airhus	Quantity global per capita (Multiplier)	1Kg rods à 1cm2 * height H20: 10 m Fe : 1.3 m vertical	1 Kg slide à 0.01mm * 100m2 Wt. like H2O horizontal	Landfill CO_2 in atmosphere (storage)	Landfill CO_2 in oceans / land (reaction)
36 Gt (2020)	Value /AirCol	AirHus, AirCol	rods	Stretch film m2	A) Air	B) Sea / Land
Earth 4.7 t per capita	7 Kg (7 ppm / year	650 (6,5 Hectare)	7 (*650)	700 (*650) ∑ 455'000 m2 => 2/5 in air; 3/5 Sea /Land	3 Kg (2 ppm) (*650) rods (Film * 100)	4 Kg (5 ppm) (*650) rods (Film * 100)
5 Head family 23 t	7 kg	3250 (Air over 0.3 km^2)	7 (*3250)	700 (*3250) 2,2 km^2	3 * 3250 (Film * 100)	4 * 3250 (Film * 100)
8.5 Liter/100 km 1 l : 2.33 Kg CO2	8.5 L*2.33 Kg/L => 20 kg CO2 / 100 km ⇒ 20/7 = 3 AirHus loaded with 7 ppm per year	Assumption: 10'000 Km/year => 3 *100 AirHus loaded With 7 ppm by mobility	300 rods	∑ 30'000 m2 Strech film	thereof 2 / 5 in Luft	thereof 3 / 5 Meer/Land

Abb.22 Conversion => CO_2 Transparency

valuation of relieving natural areas as CO_2 sinks are gaining rapidly increasing importance in economic life. Costs and benefits are increasingly moving in the direction of consumption and reuse in a circular economy.

Geographical material flow analyses as an export-import regime of CO_2 and other greenhouse gases are becoming increasingly important for fast and fair action. How much CO_2 is released in an area and how much is exported with a globally uniform CO_2 distribution. The grey energy as a CO_2 release for the provision of materials, services or products, produced locally or globally, can be brought into a pictorial and generally easily comprehensible form of pollution of AirHus.

5. The condition of the air determines climate in leverage effect

With an annual amount of around 1.5 billion terawatt hours of TWh the sun radiates in one hour about as much energy to earth as humanity consumes with around 160,000 TWh[40] in one year. The solar radiation is almost four potencies higher. The additional CO_2 as a temperature-determining gas therefore effects a lot regarding leverage,

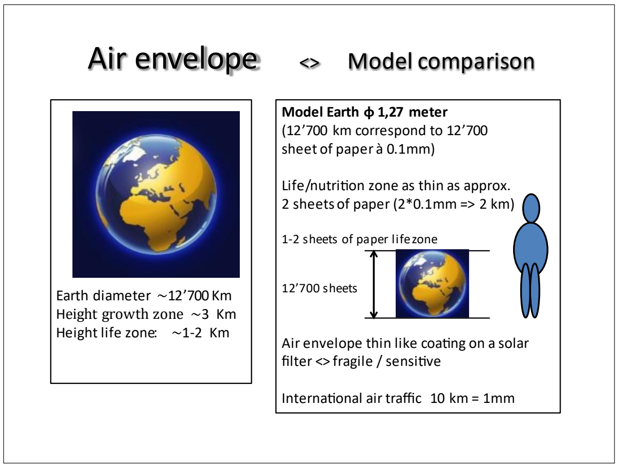


Abb.23 Air envelope as a thin layer

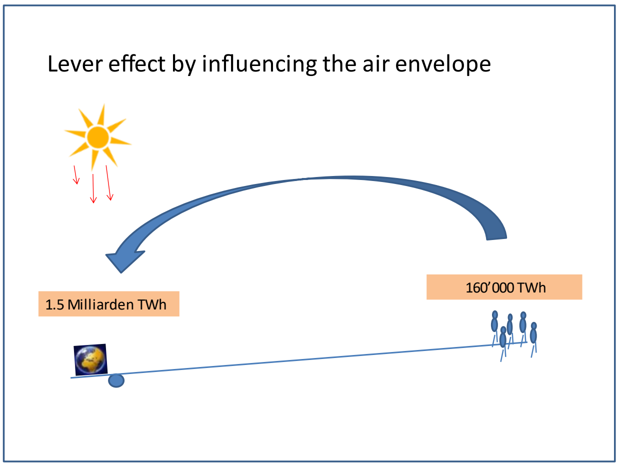


Abb.24 Energy ratio sun / world energy consumption

even if its share in the air is only small. The dumping of our harmful exhaust gases into the atmosphere - our 'respiratory sphere' - is an entropy-increasing and globally existence-endangering distribution with a long residence time. The anthropogenic energy consumption as well as the release of greenhouse gases bound in the soil over primeval times acts like turning the thermostat on the far larger back radiation energy, which remains in excess in the greenhouse earth. Our action on the air envelope has a stressful effect with dangerous lever characteristics.

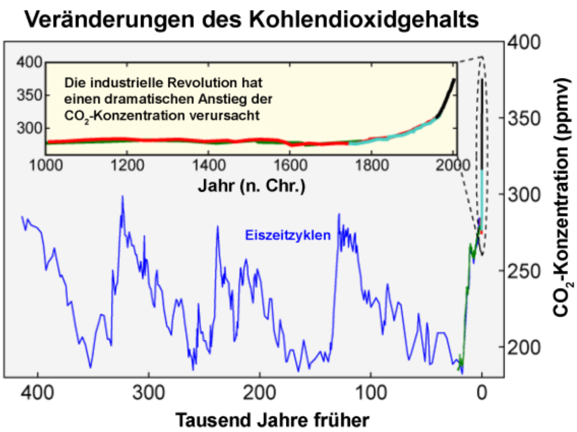


Abb.25 CO2 Concentration over 400'000 years

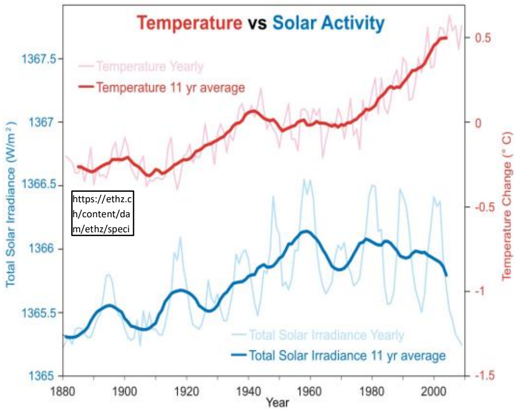


Abb.26 Solar radiation intensity

If our energy share were only additive without collateral damage, we would hardly have a problem from an energetic point of view. However, the additional CO_2 of the anthropogenic energy content which allows the excess of solar energy to be reflected again changes greatly the filter effect of the air envelope. In addition to the energetic release of CO_2 through fossil combustion, there are other serious CO_2 release imbalances such as humus degradation. It is a self-reinforcing feedback, while nature knows only the negative feedback in geological history, namely the eradication of exponential excesses. The intensity of solar radiation has also been decreasing slightly for around 60 years and the average global temperature has increased conversely.

For thousands of years, the proportion of CO_2 reflecting heat rays was around 1 in 3600 air molecules (~280ppm). In 2020, the ratio is already 1 to 2400 (415ppm). This CO_2 is the basic nutrient of nature and, in the right natural concentration, the regulator of the climate, but in the man-made oversaturation the driver of climate change. The over-fertilization of the biosphere with CO_2 also accelerates biological growth with accompanying risk factors.

The Keeling curve of the CO_2 values as well as the impressive visualizations of scientists as well as dynamic long-time measurement values of NASA[41] among many other records obviously show the dangerous development of the climate. Combustion processes caused by humans or forest fires can be corrected with timely action, melting[42] and thawing processes as well as growing energy storage and acidification of the oceans are no longer correctable. They are the logical consequence of too much energy and pollutants as well as damage to ground-level cycles due to overuse and destruction of networked dependencies in the soil structure.

The graph of the CO_2 concentration over 400 thousand years reflects natural evolutionary processes up to the time of massive human intervention on the air envelope with an almost vertical increase in CO_2 upwards. This is an exponential development that does not mean long-term survival without decisive countermeasures. The air has priority value above everything else. Without preserving their condition close to nature, the necessary SDGs (Sustainable Development Goals) of the international community cannot be achieved.

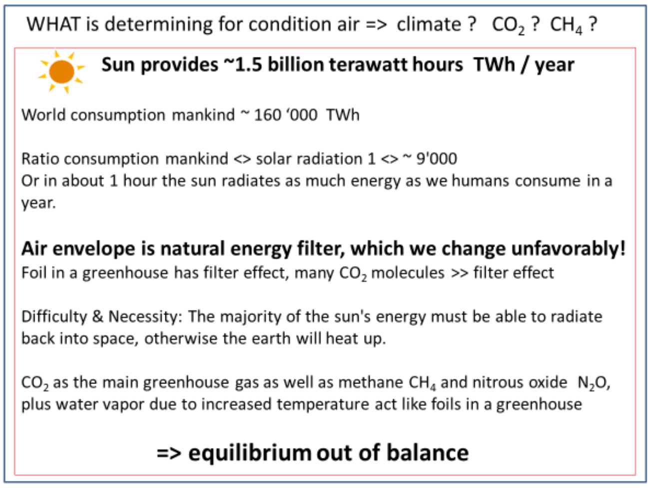


Abb.27 Air envelope as an energy filter

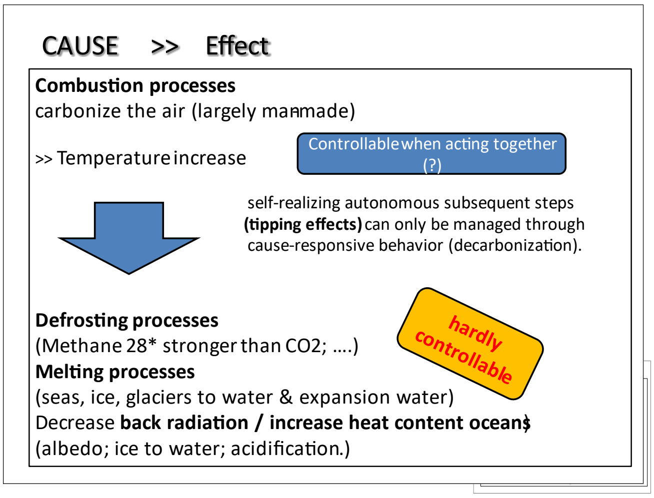
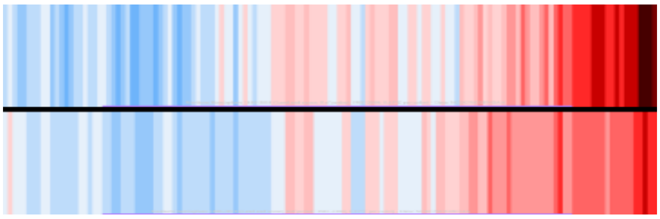


Abb.28 Combustion & defrosting processes

The visualization of the development of the earth's mean temperature between 1880 – 2018 as a Climate strip (north/south hemisphere)[43] impressively shows what humanity and the whole biodiversity face as a warning danger. The spiral video representation[44] by Ed Hawkins in the monthly grid of the same period resembles an opening spiral that is no longer kept within limits. The maximum limit of +1.5°C set by the global community has already been clearly exceeded in some areas, such as the polar regions. Searching, finding and implementing solutions[45] is a priority. A pioneering role of willing states, organizations and individuals is necessary, but at the same time it is also an economic opportunity.



6. Interfacial Processes

Biological, chemical and physical processes take place on contacting surfaces in the atomic and cellular range. Through self-similar and biologically genetic reproduction, the cellularly small gradually becomes larger and through interactions structurally more complex. If the atoms  (molecules) in a tiny drop of water of one cubic millimeter in volume were in turn as large as the starting drop itself, then this would result in a water quantity greater than half the annual precipitation of the whole of Switzerland. The sheer infinity in the small is juxtaposed with the sheer infinity in number, which in turn allows the growth, becoming and combination of relatively fewer biological elementary substances into the huge structural and fractal diversity in nature[46]. Despite the high complexity of the links, similar patterns emerge on a small scale as in the large, such as structure from leaf panicle to tree structure or structure of branching in the lungs to fanning out river deltas, each photographically similar if the size comparison is hidden.

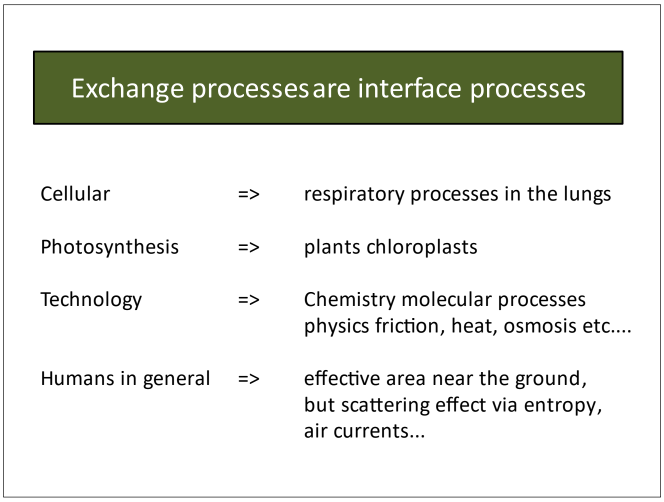


Abb.29 Interface

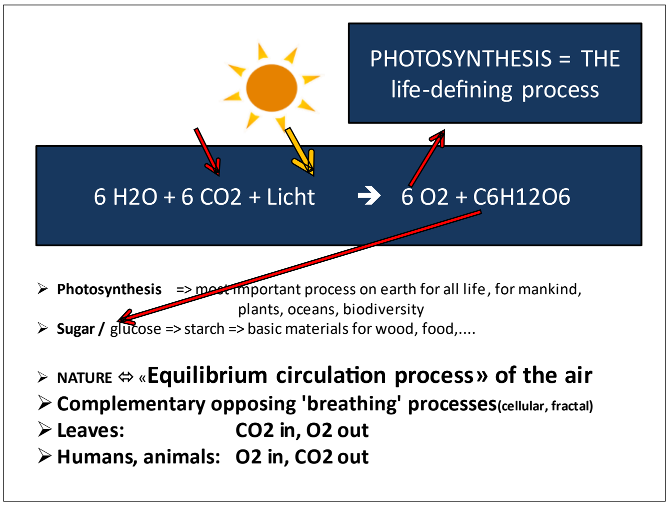


Abb.30 Photosynthesis

The air of the ground-level atmosphere is about a thousand times lighter than water. It envelops us humans like the whole fauna and flora, mixes with water and is the process medium of the first order. The photosynthesis process $6\ H_2O + 6\ CO_2$ + light➔ $C_6H_{12}O_6 + 6\ O_2$ takes place in nature on contacting surfaces with the air and light and determines our whole life. A perfect circular symbiosis develops from a few basic elements. If we **consciously** focus on the photosynthesis process as nature's most important process, then it should be possible to couple it with increasing **responsibility**.

The physical and chemical state of the air with its energy content is primarily decisive for the preservation of nature in all aspects, from biodiversity to all areas of life on land, ice and in the sea. Natural processes can be defined in space, function and time and condensed descriptively. They can be geocoded to large and smallest rooms and these in turn can be projected onto surfaces. Functions are the result of processes that are manufacturing, consuming, complementary, stressful or in many other interpretations. Time is the uniform progressive sequence of fast to slow process steps and important parameters of consideration.

7. AirValue ⬄ Footprint

The world's population has more than doubled exponentially since Niels Armstrong first stepped on the moon half a century ago, especially in Africa. The question of the change in the air envelope and the climate are indirectly related to the exponential growth of the population. If one calculates the current growth rate with doubling in 50 years back, then in the year 400 only 2 people would have had to be on earth to reach today's world population. At the turn of the first millennium, after 13 doubling steps, there would have been more than 8 thousand people and at the last millennium after 33 doublings more than 8 billion people. Historically, about 300 million[47] people were on earth in he past, but nature and living conditions used to counteract exponential growth.

With a growing population, fewer AirHus units or AirCol columns are mathematically in relation to every citizen of the earth every year, globally around 650 units per capita, of which around ~30% on land and in conurbations a fraction of it. The question is how many AirHus or AirCol units are consumed or charged in comparable time units, for example per year on the liabilities side. This requires reliable answers on how the activities on the liabilities side have an impact. How many AirCol columns do I burden with my heating/cooling needs at home, how many of them do the industry and the public sector has to offer me for a medium product consumption, how many air columns do I burden with mobility and the like. The considerations and assignments here are congruent with the calculation of the footprint and can be derived from this.

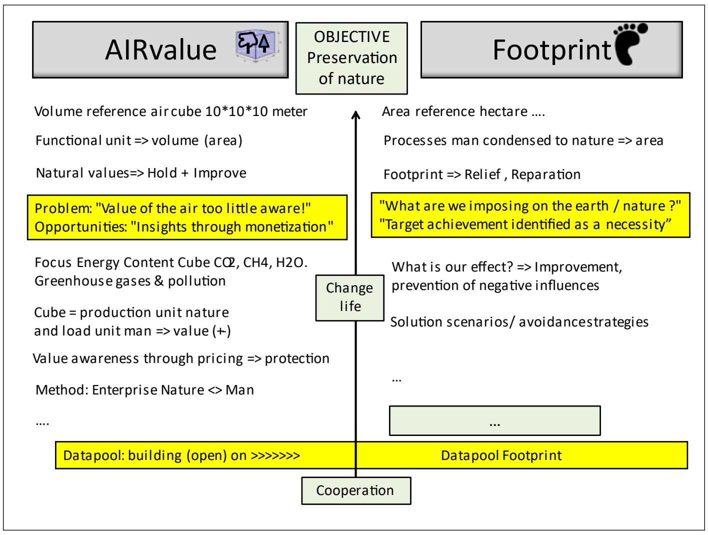


Abb.31 AIRvalue and Footprint

The footprint concept focuses on the consumption and loading of resources, while AirValue aims to evaluate the positive or negative process events within defined air cubes monetarily. The Airvalue concept can be based on similar data as widely available in the footprint area. The goal of maintaining a sustainable climate is the same in both places. Air is the central enveloping element that functions sustainably for flora and fauna in a narrow temperature band. Crossing borders lead to threatening tipping effects[48], which must be avoided in good time.

With the emission rights, only the burden side is actually evaluated and traded, not the producing side. We calculate and assess our burdensome footprint in order to reduce it over time in the knowledge of the many influencing factors and to protect the environment[49]. The production value of the air in terms of $CO_2\downarrow$ and $O_2\uparrow$ has so far been little transparent. The determination of the value shows accompanying **potentials of solution**.

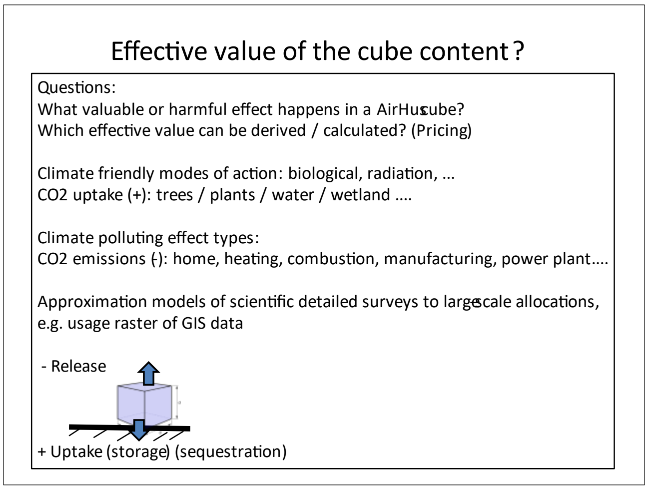
By analogy to the real economy, air can be regarded **as a commodity** of production, it is produced by nature and it is consumed, or burdened or polluted. Air or the atmosphere acts like a thin solar filter similar to a coating of a solar glass. It is an active and inert gas mixture with life-defining properties such as oxygen exchange, heat storage capacity, kinetic energy and ability to absorb and transport water. Natural areas perform such functions and deserve conscious identification for their protection.

8. NATUREenterprise ⇔ REALenterprise

Natural processes are complex flow, growth and cycle processes in networked and mutually adaptive equilibrium. The **NATUR company produces** biomass in the photosynthesis process when converting physical into chemical energy with the release of oxygen and with the main consumption of the input materials CO_2 and water. The environment must also be right for nature. It is part of it and, depending on its geographical location, has adapted to the usual temperature values. Nature in a negatively changing air envelope is losing the viability of its biodiversity.

NATURE and MAN

The balancing of the earth[50] includes the active variable nature and man, whereby man himself is a dependent part of nature. Nature optimizes for balance and is time-independent. It is a balanced system that has developed, adapted and harmonized iteratively over millions of years. Growth is juxtaposed with reuse, life with dying and re-emergence.



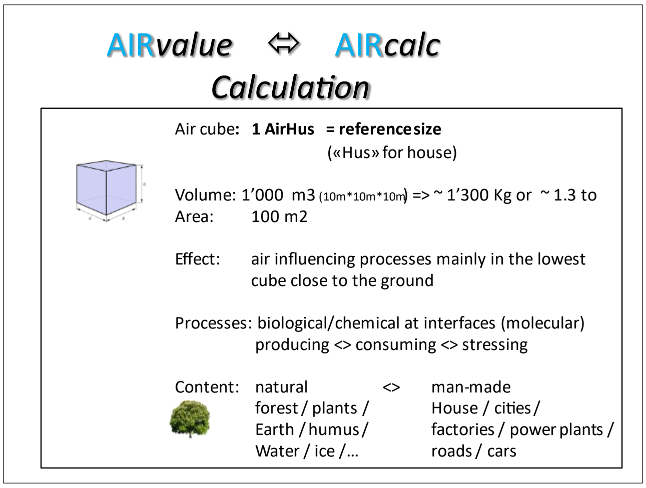


Abb.32 Active value AirHus

Abb.33 AIRvalue to AIRcalc

The work of humans changes the energy balance of nature as the most important regulatory element of a self-controlling biosphere that balances over primeval times. In modern times, human activity is aimed at growth, nature at recycling and growth. Perhaps "growth_cycling" as a combination of both paths would be a possible future direction.

REAL - ENTERPRISE

Companies in the real economy maintain an accounting system with balance sheet, income statement of expenses and income as well as an investment account. Products and services are produced and offered to the market, whose **willingness to pay** should cover the costs profitably, otherwise a negative return or loss results. The willingness to pay is determined by pricing. Revenues and the differentiated product costing can be represented in a multidimensional data cube in the plan as in the actual two-dimensional by the online analytical processing (OLAP). The functionality is based on matrix-calculated multidimensionally linked data in the upstream data warehouse. In this presentation scheme, which is similar to an operating accounting sheet, the cost types of expenses and the revenues with the revenue reductions are divided in columns from left to right. In the lines are the calculations and revenues of each product and / or service. Bottom-up product costing based on recipes and derived from them on material BOMs and routings (machine and labor costs) also includes the allocation of direct and indirect overhead costs via cost centers. Once all internal costs, including administration and distribution, have been accounted for, the result is a net ex-works sales price with 100% internal cost coverage for each individual product. The planned sales revenues vary according to the customers' willingness to pay, whether it is a well-performing product or a necessary complementary product in the supply mix.

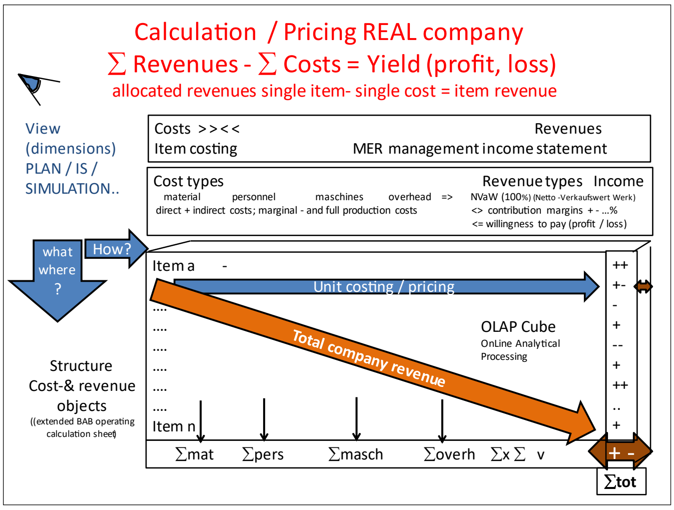


Abb.34 Calculation and pricing

If, in turn, the revenue-reducing expenses such as logistics are deducted in the pay-as-you-go system, which is similar to overhead costs, the result is an overall view of the company, which describes the success of the entire company in the tabular summation of all profits and any losses. It is a combination of the contribution margin calculation with the product costing for each sales item with the overarching relationship Revenue minus costs is positive or negative income, profit or loss. In this cube table, which for complexity reasons should not refer to transaction data, but to completed process data, columns and rows in underlying dimensions are divided into their individual data. These are cumulated in terms of time, space (cost centers), organizationally, geographically (countries, markets, branch operations) in a suitable manner, pre-calculated and directly intuitively retrievable.

COMPANY NATURE

If **one considers nature as a global company** with many local, surface-adjacent production cubes, each with an edge length of 10 meters, these reference volumes can be classified as production units or spatial cost centers. Biological and chemical processes are transformation processes at interfaces such as cell structures and can therefore be assigned close to the ground. In such cubes with the well intuitively graspable size of a house (AirHus cube), an infinite number of processes run naturally and caused by humans. What results vertically above or below each reference cube in process results in the observation period can be added to the production output of the respective geocoded cube profitably or burdening via factors, similar to the allocation of secondary cost centers to main cost centers.

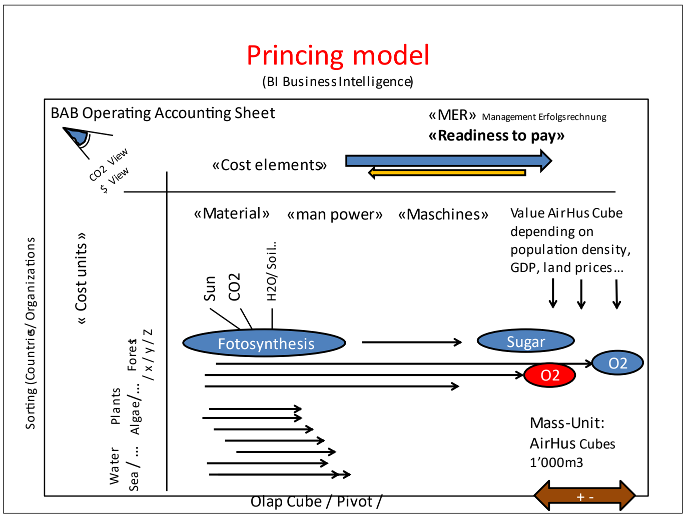


Abb.35 Pricing model Enterprise Nature

The base cube itself can be gradually broken down into smaller data cubes of one cubic meter, one liter or smaller if appropriate detailed data is available, whereby such data marts could be stored in standalone, but uniform data warehouses. These are the data ranges of laboratory process investigations down to the molecular cell area. Ecology and economy can merge into an "**ecolomy**". Management strategies and methods of business intelligence[51] (BI) can be applied to nature. ERP (Enterprise Resource Planning)[52] methods of the real economy can potentially be transformed into EarthRP.

9. PrIcing model for natural processes

The sales department uses market research to determine the predicted willingness to pay and the purchase quantity of the market for products or services of a real company and to pass on the planned prices and quantities to the internal accounting department for the calculation of the product costs. From planned revenue less the calculated costs, a positive target income is usually calculated in the plan for economically sound companies.

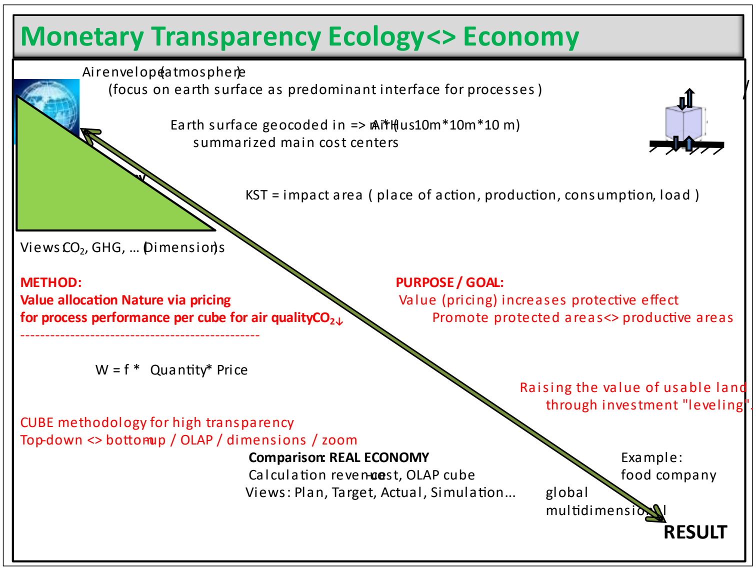


Fig.38 Transparency Economy Ecology

That **Company Nature** 'produces' with competitive compensation, whereby unbalanced excesses regulate themselves again in the long term through negative correlation or feedback. Excessive developments are reduced to systemic overall compatibility. Nature has long found and settled down a balanced balance, but is too fragile and massively endangered against our own weighty and exponential interferences.

The conversion of economic terms to processes in nature opens up the opportunity to increasingly use existing methods of business administration in ecology and to make them effective for their better protection.

Due to the great complexity of underlying data in real companies and to a far greater extent in the 'enterprise nature', it appears expedient to choose uniform views for the transparent and intuitive comprehension of the interrelationships. The cube view is a spatial volume-based and at the same time a methodical way of drilling down. On the one hand it describes processes in spatial cubes, on the other hand multidimensional data structures. Networked structures can be passed through from the summarized overall view layer by layer from link level to link level from top to bottom and vice versa. This makes interrelationships across many layer levels more vivid and thus also principle similarities and analogous behavior.

Similarities / Comparison	***Company NATUR*** *(ERP **Earth** Resource Planning)*	***REAL Enterprise*** *(ERP **Enterprise** Resource Planning)*
Strategy	*balance through recycling,*	*Yield + ESG Environment, Social, Governance*
Environmental reference	*Physico-chemical-biological energy and metabolic turnover*	*Environmentally conscious provision of services* *Capital & Employees & Environment*
Long-term durability	*Balance Energy Content Air Envelope < 1.5°C (Paris 2015)*	*Dependent on functioning environment; Rapid reduction of unnatural greenhouse effects*
Cube Calculation view	*CO_2 Input + Metabolism O_2* *(CO_2 Output Breathing)* *(as well as other GHG)*	*Products & Services* *(incl. CO_2 certificate costs)*
Goal	*Equilibrium* *Symbiosis in biodiversity* *Preservation of the environment requires technology, capital, will*	*Growth* *profitable, superior to the competition*
CO_2 eq *(CH4, N2O, SO2, H2O, CFx…)*	***de**carbonisierend CO_2,↓* *natural greenhouse effect bei ~280ppm CO_2* *man-made ~+50% out of balance*	***(Stopp) Ca**rbonisierend CO_2,↑* *Fundamental system change of many processes;* *Values-preserving, entrepreneurial task*
Structural organization	*Ecology ⇔ Biodiversity* *Molecularly iterative, repetitively networked into great things*	*Service provision Economy ⇔* *Consumption of benefits*
Volume definition air	*Cube 10*10*10 Meter* *„AirHus"*	*Cost center with workstations*
Example	*„Recycling company nature"*	*Food Company*
Extended planned cost calculation with cost types and revenues minus revenue reductions *Note: The methodological calculation comparison is economically derived from companies, but includes all CO2 producers. That's all of us.*	*Photosynthesis process (primär)* ***INPUT:*** *Material:* *CO_2 natural + anthropogen* *Water & Solar Energy (& Trace Elements))* *„Machines":* *Plants, algae, bacteria...* *Forest, meadows, sea, ...* *Air-Hus, geocoded, GIS assignment,* *natural/molecular processes,* *„Personal"* *Biodiversity* *Adaptive Symbiosis Systems* *„Overhead"* *Air envelope as CO_2 thermostat* *SDG Target Increase <+1.5°C* *1. Calculation:* *Healthy nature works for free* ***OUTPUT:*** *O2 Oxygen, biomass (glucose, nutrients..)* *H2O storage, air filtration, temperature↓,..* *CO_2↓Climate effects, albedo, cleaning, life support* *„SALE":* ***Mapping Cube Based Values*** ***Value = Factor* Quantity* Base value*** ***W_{AIRt}= F_{xy} * Me * 0.01 WE/AirHus***	*Manufacturing process:* ***INPUT:*** • *Material* *Parts List / Recipe* *Auxiliary supplies* *1. Machines* *Production* *Workplace* *Cost center* *Work plan / recipe* *1. Personal* *enrolled in school* *Learner* *1. Overhead / Marketing* *Control / Regulation* *Management* ⇨ *Calculation:* *$N_{etto}V_{erkaufs}P_{reis}a_bW_{erk}$ 100%* ***OUTPUT:*** *1. Products / Articles* *2. Services* *3. Covering living needs with side effects* *SALE:* *1. Proceeds* *2. less revenue reductions* • *Yield +- per product (& individually)∑*
Dependences ***Cause ⇔ Effect***	*Energy increase (temperature)* *due to CO2eq greenhouse effect* *as a basic survival task planet*	*Transition to sustainable systems and "renovation" of our earth as an entrepreneurial task with simultaneous opportunity for economic prosperity*

Abb.39 Comparison of company nature to real enterprise

10. Top-Down ⇔ bottom-up Valuation

For the base cube, the default value is 0.01 WE (value units)

$$Value_{AIR} = n_{AirHus} * f_{Faktor} * 0.01\ WE_{(Werteinheiten/AirHus)}$$ (WE = CHF, Euro, Dollar,….)

The near-boundary air volumes to soil and water are taken into account, where a physical or chemical process exchange is effective. This allows a simple priority assignment to regional to global area sizes, countries, continents, seas. The monetary valuation of AirHus units can be set in relation to various criteria using the factor 'f', such as vertical effective height, CO_2 flow rate for incorporation or release, O_2 production rate, originality, biodiversity, population density, GDP, land prices, national or regional air quality and others. This on the producing and burdensome side. The factor 'f' is a price factor of different valuation perspectives and demand variables.

If one considers the growth of nature based on recycling as a development towards diversity and anthropogenic growth as a development towards structural unification, then, with regard to nature, solution perspectives can be derived in the technical field towards localized decentralization and in the agricultural field towards resource-saving biotechnological production methods. These are sustainable solutions that are becoming increasingly important in energy production, in the food sector and in many other economic sectors.

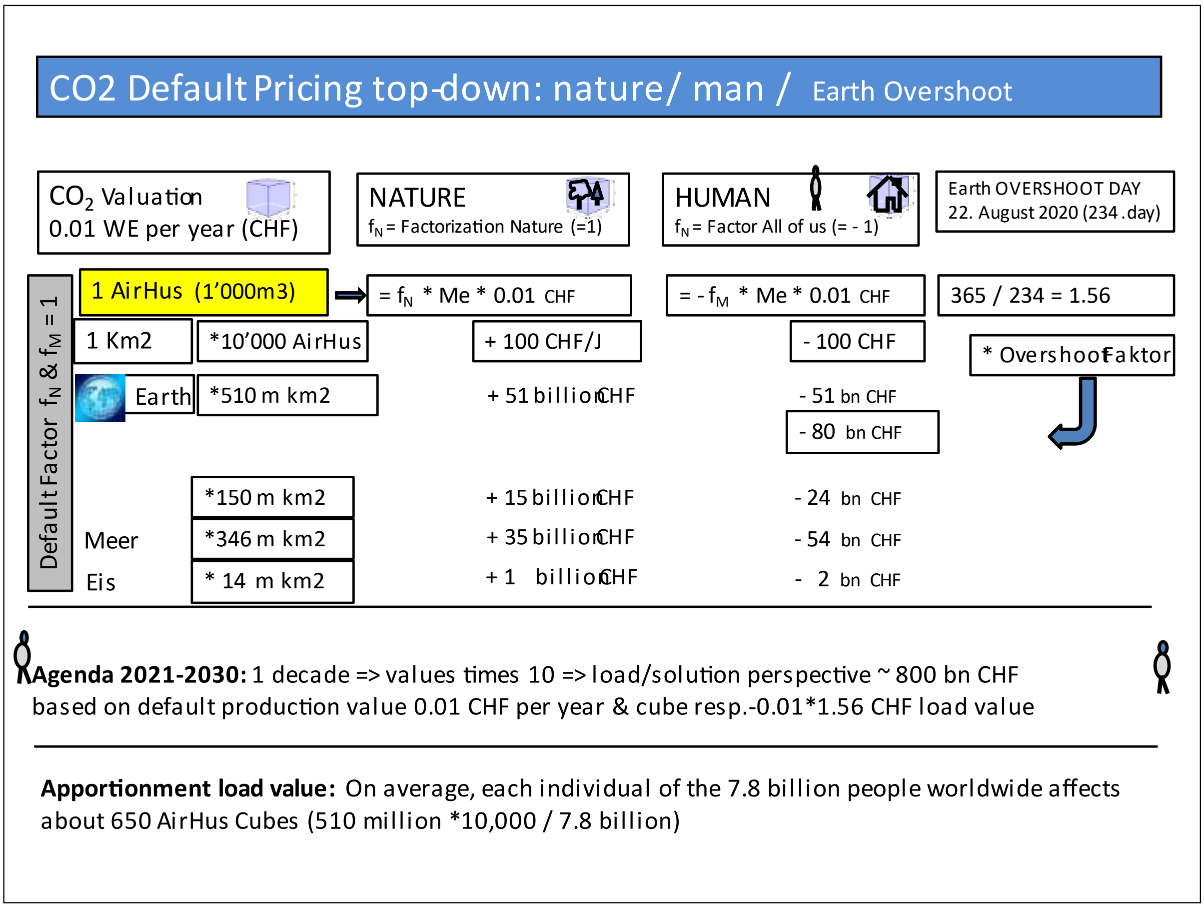


Abb.40 CO2 Default Pricing

The Amazon jungle with 5 million km2 and an average assumed forest height of 4 cubes, for example, would have an equivalent $CO_{2\downarrow}$ /$O2_{\uparrow}$ production value of 0.01 WE per cube per year, which totals a value allocation of 2.0 billion WE per year.

$$W_{AIR} = n_{km2} * f_h * 0.01\ WE = 5 * 10^6\ (km^2) * 10^4\ (AirHus/km^2) * 4 * 10^{-2}\ (CHF/AirHus) = 2\ billion\ WE/Jahr$$

In Liechtenstein with an area of 160 km2 and about 100 km2 of forest, the annual exemplary value assignment would be one hundred times the defaut value, which would result in CHF 1.00 per AirHus per year or a total of CHF 2.0 million with twice the cube height (20m forest height). In Switzerland, that would be about 250 million francs. Something similar could be measured for agricultural soil or for any usable or natural area according to the very detailed environmental data available and evaluated by means of pricing methodology. A blur assignment could be carried out by existing satellite evaluations with color or similar criteria by transferring determined performance and pricing parameters such as CO_2 sequestration in one study area to others.

The question arises: How great does the $CO_{2\downarrow}$ /$O2_{\uparrow}$ recyclability of nature have to be in order to compensate for the additional anthropogenic burden with excess CO2 and consumption of O2? What about the transport or import and export of CO_2 over long distances? In Western Europe, each individual produces about as much CO_2 annually as the wood of four large beech trees, which has grown over decades, weighs. A sale of indulgences with business as usual and planting trees for damage compensation is not possible. The Potsdam Institute for Climate Research[53] writes 'Trees are not CO_2 heroes', 'Plantings can play a limited but important role if they are well managed', 'while avoiding emissions plays the main role'. One hectare of forest stores about 6 tons of CO_2[54] per year across all age groups. Nature is far from being able to cope with anthropogenic emissions without suffering irretrievable damage itself. In the case of water, which we see better and more consciously than air, positive things have been achieved in many countries by avoiding and cleaning up pollution. In the case of air, rapid success is equally imperative for life-sustaining living, which requires a tremendous shift in direction, but is not yet seen in many places.

Factor f: The positive or negative factor "f" is the descriptive quantity for production values of nature as well as for stressful production or event values of human activity. The composition of "f" can include many partial aspects and is subject to assessments of value, place and time. The factor f is a quantitative measure of the CO_2 mass balance in a cube as well as a price-giving discretionary. The factor can be progressively developed and adjusted. It is positive for CO_2 sequestering processes and negative for CO_2-polluting processes. In the graphical representation, positive values are displayed as sinks downwards and vice versa, or as colors according to common conventions and intensity levels. This results in graphical representations as roughness or color samples that are similar to known illustrations.

Cost centers in real companies are functionally, spatially and organizationally arranged. Overhead costs are allocated to the machine and personnel cost rates of cost centers. The geocoded cube cost center AirHus can, for example, be a naturally producing unit in case A or an air-polluting unit in case B. For A, this would be a mixed forest of 1 km2 in size with plants A1, A2, A3 and in case B an urban development with types B1, B2, B3.

The value of the processes is defined by the determination of factors per influencing variable. The calculation or breakdown of corresponding data to geocoded AirHus or volumes with base areas hectares, Km2 or GIS areas (GeoInformation Systems) is calculated by the quantity in the formula. The collection of natural and anthropogenic CO_2-relevant process data is carried out by merging largely existing data through search and less through new research.

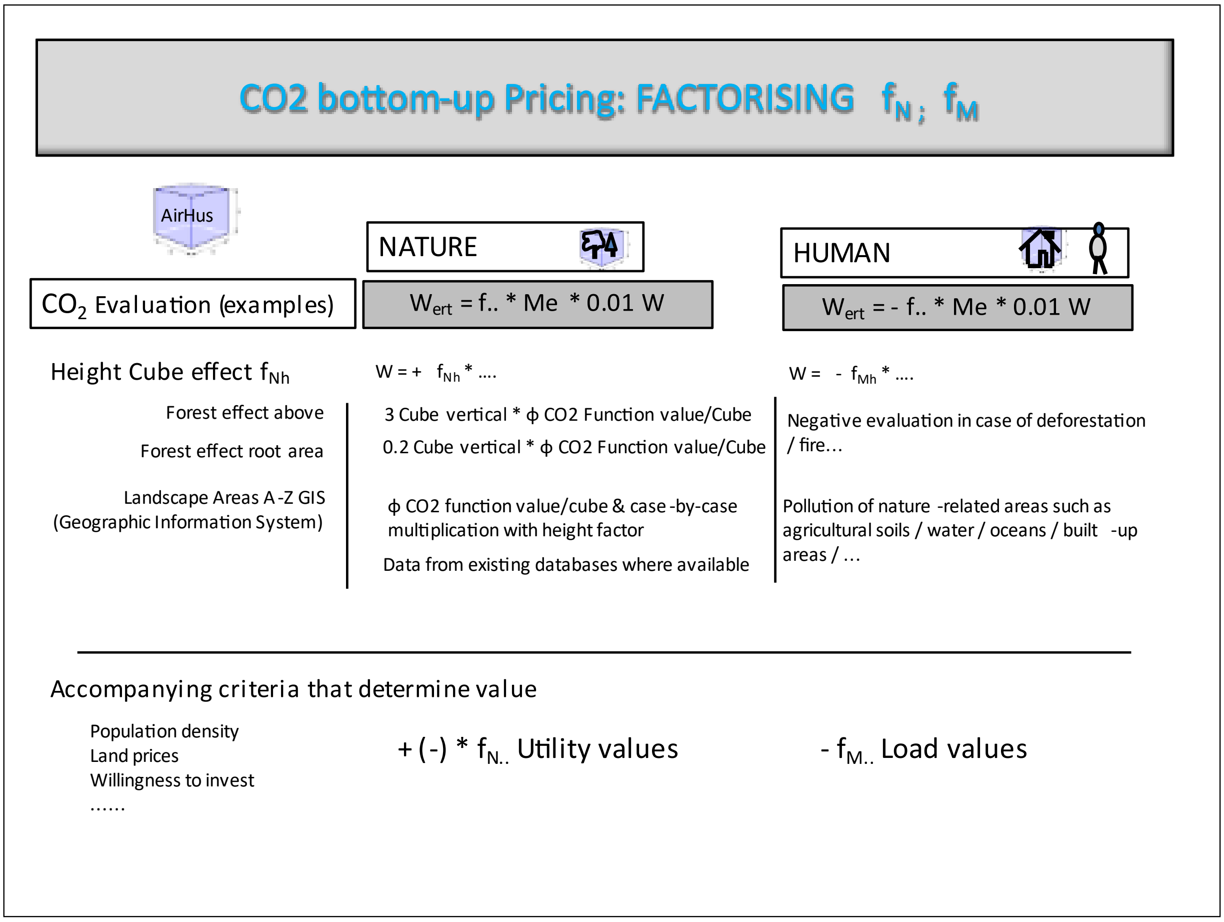


Abb.41 CO_2 Bottum-up Pricing

FAKTORISIERUNG	$f_{N(ature)}$	$F_{M(an)}$
CO_2 Process evaluation regenerative (+) burdensome (-	AirValue = (+-) AV	AirValue = (- +) AV
Processes (priority view)	**Photosynthesis** **(CO_2↓, O2↑ Respiration, nutrient cycling, decay,...)**	**Economic-& life processes** (combustion, respiration, air pollution, ..
AirValue: W_{ert} =	+ f.. * Me * 0.01 WE	- f.. * Me * 0.01 WE
Legend: Factor f = Quantity Me = Value Unit WE =	Combination of various evaluation factors Number AirHus Cube (area: local to global) 0.01 CHF (≈ 0.01 EUR, ≈ 0.01 $)	id. id. Id.
Fictitious underlying value (f=+-1): BW =	+ 0.01 WE/AirHus (Value Unit ≈ 0.01 CHF)	- 0.01 WE/AirHus (Value Unit ≈ 0.01 CHF)
Factor f.. ≈ f_{xn} + f_k * ($f_{xy..}$)-fn*(....)+..	majoritarian + (= CO_2 embedding↓)	majoritarian - (= CO_2 releasing ↑)
f_{Zeit} =Cycle times (CO_2, O_2...) Effect dependence on factor time	.../ year↓↑, .../ day↓, night↑	id.
f_{AirHus} = ϕ Impact function nature, man (top-down)	ϕ Effective function of natural areas CO2 integration/emission, albedo,...	ϕ anthropogenic impact function: Houses, cities, industry, power plants, transportation, recreation, infrastructure,...; on oceans, poles....
f_{CO2} = Sequestration	Kg CO_2↑↓/AirHus & Function type	Kg CO2↑↓/AirHus & Function type

f_{O2} = Oxygen production	O_2 Release (regenerative)	changing, burdening
$f_{Glukose}$ = not part of AirValue	Nutrient cycle	
$f_{Preisfindung}$ = Willingness to pay	Willingness to pay for 'identifiers' (personal identification with protected zones)	Certificate costs for CO2 & equivalents monetary awareness increase for future
$\mathbf{f_{CO2/O2\ Detail}}$ = bottom-up	Plants, bacteria, algae, cells....	Direct CO2 output & indirect grey emissions (imports), imputed CO2 bottom-up fairness.
$\mathbf{f_{Höhe}}$ = Multiplication height / depth Forest effect above Forest effect root area Landscape areas A-Z (GIS) (Geographic Information System)	= f_{Nh} * .... 3 Cube vertical * ϕ CO2 Value/Cube 0.2 Cube vertical * ϕ CO2 Value/Cube ϕ CO2 Function value/cube & casewise Multiplication with height factor Data from existing databases	Negative assessment for deforestation/fire.... Pollution of nature-related areas such as agricultural soils / water / seas / Development / ....

Abb.42 CO_2 Calculation Factorising

The potential connection to existing databases and the evaluation based on this facilitates the implementation of the AIRvalue evaluation. Easily understandable data should bring about actions in the sense of better climate protection.

Economics knows 'hidden reserves[55]' that mean security. Ecology needs very large 'silent natural reserves[56]' to secure the future and viability. The duality of nature's production value to man-made stress can be transparently translated into a solvable equation.

Burden-oriented certificates could be related to solution-oriented "identificates", as is successfully done in compensation while at the same time gradually reducing emissions from large polluters. In this context, identifiers denote areas that undergo deliberate evaluation with combined protection.

Top-down pricing can be set in relation to the total value of CO_2 certificates globally, country-by-country or regionally. This is one possible reference relation among many. In 2017, around 163,000 TWh of total energy were consumed worldwide and 36 billion tonnes of CO_2 were released[57]. This results in a de facto increase of ~7 ppm, whereby 1 ppm in weight percent corresponds to 1.52 kg of CO_2 in an AirHus or AirCol, respectively. The annual additional CO_2 pollution measured in the atmosphere accounts for about half at~2 ppm or around 3 kg per AirHus. The larger share from fossil combustion and other large CO_2 sources such as soil degradation is absorbed by the sea and vegetation up to a foreseeable saturation point.

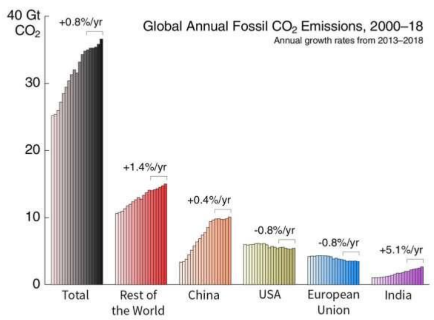


Abb.44 Global CO2 Release

If one assumes approximately per ton of annually released CO_2 globally average externalized certificate costs of 20 WE (currency units), then a load value of ~ - 0.14 WE (36 billion t * 20 WE/t ./. $5.1*10^{12}$ AirHus /Earth) is calculated per AirHus for the additional 7 Kg CO_2 emissions. Since an average of 650 AirHus per inhabitant of the earth can be attributed, this would generally mean a cost burden of 91 WE or 91 CHF per year. If several trees of medium height and age stand on the 100m2 floor area of an AirHus, they bind about 60 kg of CO_2 annually[58]. This results in a production value of CHF 1.20 (0.06 t * 20 CHF/t) per AirHus equivalent to the certificate costs. Even if part of this value is needed in nature's natural respiratory cycle and is not available for the additional anthropogenic CO_2, the value gives an indication of the intrinsic value of nature and importance for its preservation. Converted to the global forest area of approximately 40 million km2, this amounts to CHF 480 billion ($1.2*40*10^6*10^4$ WE) or amounts deemed necessary worldwide at COP26.

The top-down view can be gradually broken down from above to forest types, forest areas, average tree heights, CO_2 binding potential and can be approximated bottom-up by cellular photosynthesis process by tree species, vegetation, leaf species, geography, GIS areas. The result is monetary values designed to make the strategy of preserving nature's 'hidden reserves' more visible and obvious.

CO_2This would correspond to about twice the existing forest area worldwide[59]. Reforestation is a necessity to the extent feasible, but forest is not the better solution everywhere because of low back radiation. 'Conclusion[54]: There is no alternative to drastically reducing the exchange of greenhouse gases.' The plant sequestration of CO_2 is enormously important in the preservation of existing and new natural systems that act in compensation. However, without rapid and massive decarbonization of anthropogenic activities, the constant heating of the atmosphere and in particular of the seas and land areas with far greater, long-term heat capacity than the atmosphere itself will not succeed.

In Switzerland, CO_2 emissions in 2019 across all equivalent greenhouse gases were 46.2 million tonnes[60] or 1119 tonnes per Km2 for a total area of 41,285 km2. When transferred to an AirCol air column, this results in an increase of 112 kg of CO_2 or a quarter of the geologically balanced value of around 426 kg (280 ppm) in one year if the CO_2 export is excluded. This in turn could be used to calculate a comparison with the limit value of the air quality. The certificate costs in Switzerland amount to CHF 96 per tonne of CO_2. For an AirCol column, this would be CHF 10.74 or the factor f related to certificate costs would have a value of CHF 10.74 as a multiplication of the underlying of CHF 0.01. Load-reducing, CO_2↓ integrating processes or landscape areas are on the yield side of the equation, load-oriented processes on the cost side. The goal of Airvalue is the economic and entrepreneurial solution of necessary system changes by means of impact investments.

Evaluating the air in CO_2-recycling and O_2-producing cubes should not mean a new tax burden, but should create a transparent impact investment for free capital and for private self-commitment, which seeks life-defining benefits locally and globally. There are several participation possibilities[61] such as geocoded legacies (similar to lease agreements) on existing and maintaining $CO_{2\downarrow}/O_{2\uparrow}$ producing areas, whereby with the landowners a participation strategy for the long-term or permanent preservation of their air-efficient areas (- CO_2 / +O_2), on the one hand and participation in new impact investments in the sense of air improvement should be given as far as possible in the regional vicinity of their areas.

An important goal of the impact investments are measures for the (- CO_2, + O_2) relevant, qualitative elevation of inferior to higher-quality usable areas. Investments in technological improvements such as water management and energy with an impact on a better air balance are other opportunities for participation. Transparent geocoding (approved and coordinated territories) could create a personal creditable legacy for each citizen, similar to sponsorships.

When we buy a chocolate bar, we buy the product, not the production unit. The bars can come from one or many plants in different countries. Similar to chocolate bars, air is 'distributed' worldwide. For chocolate bars we have (mostly) internationalized production regulations, we have a monetary exchange value. For air, we only have this to a limited extent. A chocolate bar has nutritional values, flavors, appearance, packaging, shape and must satisfy several senses. The air and with it the 21% oxygen molecules meet on a cellular basis with the nutrient molecules of the bar formed from CO_2 and burns them. The air has no shape, but due to its considerable weight kinetic movement potential, acts as a carrier and exchange medium for water and heat and cold.

11. Holding strategy & leveling of useful areas

Nature must be preserved where it is intact. Land areas in poor condition should be brought to a better level, a higher level, whether through more natural and climate-friendly use or transformation. Decarbonisation through efficiency enhancement and alternative innovative technologies[62] is an overarching urgent requirement of the international community. Other disturbed cycles such as soil culture and humus loss with CO_2 release into the atmosphere must be solved in a networked manner. Barak Obama, as President of the United States, said, 'We are the first generation to feel climate change and the last to prevent it.'

WAYS TO SOLUTIONS

Problem perception & recognition => **Sense of responsibility**

My/your contribution?

Solutions
Preserving / protecting / restoring natural systems /
sustainable technology for natural system solutions
Recycling where sensible / possible

A somewhat different view: "Sorcerer's Apprentice" by J.W. von Göthe:
'Die ichrief, die Geisterwerd ich nun nicht los'.
There is no master we can call, only we ourselves can solve our own problems that have gotten out of hand!

Capital: economic and rapid deployment in sustainable and promising solutions on the government and private side;
private foundations with combination potential for impact investment.

TIME: A lifetime 8-10 decades; **SOLUTION TIME 1-3 decades!!**

Abb.44 Ways to Solutions

We are used to calculating the profitability of investments over the useful life. For household appliances or heating systems, we are happy to expect 20 to 30 years. Retirees hope for a similar length of time, and youth pay in for a time perspective far beyond that. Today, we live in a time in which we attribute a shorter 'useful life' to our earth than to our own products and supposedly safe hedges without massive countermeasures. In technology, we know preventive maintenance. For Earth, our immeasurably beautiful planet, we must do so emphatically on a larger and more serious scale. This results in a value-based 'holding strategy' for existing 'production sites' of nature, such as the ecosystems forest and sea and ice. The REDD+ forest and climate protection program[63] is an international program in this direction. If these are large areas of land that should remain protected and remain natural, then the value-preserving protection effort is to be compared with a lease expense. This can be seen as an 'ecological growth & employment strategy' and should be economically forward-looking. A system setup can start small and scale if successful. The monetary fund and the owning party of the CO_2↓production units would be adequately involved in such projects. Such models would have to correspond to the economic, ecological and social basic idea of the SDGs. If these provide investors with easily understandable, economic and broadly tradable business relationships, ecologically sensible things should be achieved through a managing fund. On the other hand, the (CO_2↓; O_2↑) production good would be confronted with CO_2 pollution processes. O_2 consumption processes seem to be uncritical at present, but should be closely monitored, since the ocean as the main producer is seriously burdened by CO_2 acidification. The many data and relationships can possibly be usefully represented in a token economy.

In any case, we should avoid that for the future remedy of insured or uninsured or uninsurable loss events, we need those amounts of capital that could have been used much more purposefully in a much more targeted manner to prevent the preservation of an intact environment.

12. People and creative will

Coping with the challenging task of climate change is a joint task of all population groups. AIRvalue is to be protected in the sense of 'commonAIR'. The environment surrounds us all and we can only maintain our wealth in the long term if we quickly stabilize the energy balance[64] of our air envelope. It requires the understanding of broad population groups across borders and generations. All personal terms refer to all genders. If we consider the population in the fight against climate change in three age groups namely **youth**, **transformers** and somewhat unconventionally the oldest group of pensioners as **power developing PGen,** then these are three strong 'driving forces'. The last group, to which the author also belongs, has potential of time, experience, often also of wealth, but more modest of physical fitness and wears a great deal of returning responsibility for the stability of nature. The word responsibility includes 'to give response' to help solve global and life-defining tasks in a very short time. The Transformers are entrepreneurial implementers and designers of a necessary climate-oriented and sustainable system change with a broad, medium distribution of the willing across political and ideological boundaries. Young people with a clear, often concerned view of the future are entitled to the correct and timely action of the two older groups. The future is a question of the right design, the preservation of nature and a livable environment through investments in appropriate technologies and processes as well as in behaviors. It is an entrepreneurial task to implement existing solutions, new ideas with financial possibilities and at the same time economic prosperity. It would be desirable if, on the military side, climate change would also lead to joint alliances across ideological borders.

13. «Identificates» $CO_2\downarrow$ ⇔ Certificates $CO_2\uparrow$

Certificate trading focuses on large CO_2 emitters. Free certificate trading[65] with a broader focus on interested groups of people is under construction. Identificates could be used to create an investment impact instrument that could bring the general population closer to identifying with defined naturally friendly areas, similar to what the International Union for Conservation of Nature (IUCN)[66] plans to implement in coordination with the Paris climate goals by 2030 for around 30% of land and water areas in OECMs (Other effective area-based conservation measures). The aim is to preserve highly endangered biodiversity[67]. UNGSII[68] (United Global SDG Index Institute), an organization oriented towards the implementation of the SDGs, does something similar. However, the best protection of naturally preserved areas only works in the long term if the biological, chemical and physical state of the air as a life-giving exchange medium of each protected area remains natural.

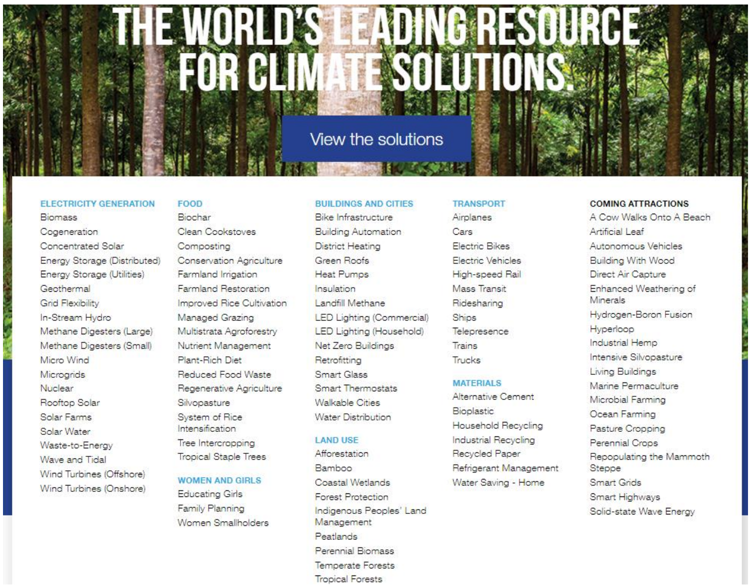
Geocoded identificates are subject to official certification according to defined standards for their value and tradability. Reforestation on a large scale is one of the most urgent measures in the broad puzzle of interlocking tasks to be solved. One such promising solution has been found by Biocarbon Engineering[69] for rational reforestation, where a drone first maps the area and then, as it flies in a few meters over it, shoot the plant seeds embedded in biological nutrient capsules in the soil. This is an innovative automation step that greatly facilitates and promotes planting as well as geocoded periodic monitoring of large land areas. In combination with blockchain software, reforestation as well as other territorially assignable environmental improvements can be coupled as certified identificates with the participating and financing rights holders.

Symbiosis in nature is the mutual complementarity for common benefit. Similarly, in the real economy, synergistic benefits are becoming increasingly important in the form of contracting offers. The energy demand for heat, electricity and climate is offered together with the entire infrastructure of photovoltaics, heat pumps, control and maintenance. Energy communities[70] of private, public or entrepreneurial participants enshrined in law are forward-looking. Contracting offers the opportunity to bundle complex areas of responsibility in high-performance solution units. Geographically, different solutions could come together to form exemplary clusters, such as the four-country region[71] Lake Constance. If we mentally assume ten or twenty years and look back, then we should not have to realize that we have not taken the necessary impulse steps in time. Here in Europe, several years of drought like

2018 could put us in great distress. If we then lose forests due to fires, residential areas in the Alps are endangered by eroding slopes, trees and the vegetation no longer incorporate CO_2, but additionally accelerate climate change by releasing the bound carbon, then the measures to be taken would no longer be preventive, but delayed and hardly repairable. Forest fires are tipping effects that we can prevent, but not thawing processes and melting processes if we do not succeed in the former. Large fires far out in the world are local events, but in a time delay with often global impact. We fly halfway around the world for holidays, why not an armada of firefighting planes?

Meadow flowers open by light and follow the sun. Insects move and control the smallest joints on their limbs and there are fewer and fewer, as every older driver can see at the windshield wiper compared to the past. Something similar happens in the sea. The huge atmosphere envelops the whole biodiversity. In photosynthesis, it acts in a similar way to our body in the smallest molecular cell area. There is a biological system similarity because we are part of the larger system like the fruits of a tree whose branches we must not break.

The structure from the smallest to the oversized human engineering has fundamental similarities. The view of the biologically small relativizes the view of the large. To reproduce the natural perfection in energy conversion and consumption, in building and network structure on a large scale is a goal-oriented sustainable path and entrepreneurially challenging. In the coming years, electricity will play an increasingly important role in the replacement of fossil fuels and in the generation of sustainable supply and production systems. Can we still afford to have developed highly complicated electronic chips or AI systems, but to have only partially researched and exploited the potential of huge surfaces such as roofs, walls, glass, nanocolors, cladding for solar energy yield? We don't create anything as diverse as surfaces. Here, socially supported research and large-scale impact contracting investments with the sale of electricity could make a significant contribution to CO_2-reducing energy production. With the Green Deal[72], the EU is playing a gratifyingly ambitious pioneering role. Clusters of good solutions could become scalable role models. A comprehensive classification can be found under 'Climate Solutions 101' by Drawdown[73].



Rank	Solution	Sector	TOTAL ATMOSPHERIC CO2-EQ REDUCTION (GT)	NET COST (BILLIONS US $)	SAVINGS (BILLIONS US $)
1	Refrigerant Management	Materials	89.74	N/A	$-902.77
2	Wind Turbines (Onshore)	Electricity Generation	84.60	$1,225.37	$7,425.00
3	Reduced Food Waste	Food	70.53	N/A	N/A
4	Plant-Rich Diet	Food	66.11	N/A	N/A
5	Tropical Forests	Land Use	61.23	N/A	N/A
6	Educating Girls	Women and Girls	51.48	N/A	N/A
7	Family Planning	Women and Girls	51.48	N/A	N/A
8	Solar Farms	Electricity Generation	36.90	$-80.60	$5,023.84
9	Silvopasture	Food	31.19	$41.59	$699.37
10	Rooftop Solar	Electricity Generation	24.60	$453.14	$3,457.63
11	Regenerative Agriculture	Food	23.15	$57.22	$1,928.10
12	Temperate Forests	Land Use	22.61	N/A	N/A
13	Peatlands	Land Use	21.57	N/A	N/A
14	Tropical Staple Trees	Food	20.19	$120.07	$626.97
15	Afforestation	Land Use	18.06	$29.44	$392.33
16	Conservation Agriculture	Food	17.35	$37.53	$2,119.07
17	Tree Intercropping	Food	17.20	$146.99	$22.10
18	Geothermal	Electricity Generation	16.60	$-155.48	$1,024.34
19	Managed Grazing	Food	16.34	$50.48	$735.27
20	Nuclear	Electricity Generation	16.09	$0.88	$1,713.40
21	Clean Cookstoves	Food	15.81	$72.16	$166.28
22	Wind Turbines (Offshore)	Electricity Generation	14.10	$545.30	$762.50
23	Farmland Restoration	Food	14.08	$72.24	$1,342.47
24	Improved Rice Cultivation	Food	11.34	N/A	$519.06
25	Concentrated Solar	Electricity Generation	10.90	$1,319.70	$413.85
26	Electric Vehicles	Transport	10.80	$14,148.00	$9,726.40
27	District Heating	Buildings and Cities	9.38	$457.10	$3,543.50
28	Multistrata Agroforestry	Food	9.28	$26.76	$709.75
29	Wave and Tidal	Electricity Generation	9.20	$411.84	$-1,004.70
30	Methane Digesters (Large)	Electricity Generation	8.40	$201.41	$148.83

Abb.45: Paul Hawken, The World's leading Resource for Climate Solutions, Drawdown (covive.com)[63]

Questions are the breeding ground for ideas and solutions, including questioning entrenched, not sustainable processes and ways of life. The majority of people own a smartphone with access to world knowledge. Just as through Foto App's (Google) plants, faces or in the software of autonomous driving the close environment is recognized, so an environment app would also make sense, which recognizes worldwide potentials of the necessary action and underpins it with positive comparison solutions. The large number of mobile phones in combination with photos and geodata are a controlling instrument that offers many possibilities for improving the environment in the future. The cube view with zoom on details is also suitable here.

14. «whatever it takes» as a guideline

At COP26 in Glasgow, Italian Prime Minister Mario Draghi transformed his famous words from his time as President of the European Central Bank (ECB) into 'whatever it takes[74] to preserve the environment'. Capital markets are increasingly dependent on a healthy environment and the preservation of a stable nature while saving the entire interconnected biodiversity at all stages of evolution. Capital is a virtual asset which, like the aforementioned output of production, is subject to the nature of pricing and willingness to pay. Without an intact environment, everything loses its value. Capital is a monetary right that can and must achieve a great deal of value. However, it does not protect against capital errors. The decarbonization of the economy and social life is the most important demand of the near future for the world community, in addition to maintaining peace. This task is a predominant, beneficial business area for capital.

15. Alliances in cooperative communication

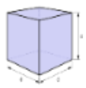
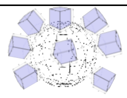
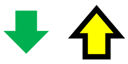
The change in our environment due to our way of life and the increase in population is a factor in a volatile climatic future. How would it be if many exponents from the P-Gen or 'power generation' of retirees who are convinced of the climate-oriented To Do would join forces with experts across political and geographical boundaries to promote science-based entrepreneurial solutions as a community? The identification of the systemic relationships could be one aspect of such a longer-lasting cooperation.

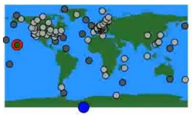
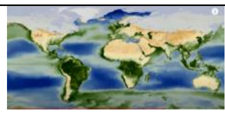
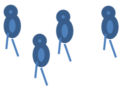
An app with a geographical zoom similar to google.maps could show the CO_2 embedding potential and on the other hand the CO_2 pollution of a worldwide grid of AirHus Cubes. The technical possibilities of artificial intelligence based on a large number of analytical data, be it color samples, geometries or measured values, could bring a lot of transparency for more conscious human action with increasing accuracy.

What does our world look like in 10, 20 years? To this end, developing as clear ideas and perspective scenarios as possible about scalable showcase projects that are in harmony with nature and make everyone's lives more sustainable is a social task of the utmost importance. The author of this working paper is a retired chemical engineer and economist with a technically and business-oriented career path in the industrial sector. The motivation to publish these reflections as a working paper lies in the responsibility of the 'P-Gen' for our descendants or next-generations, to whom we must leave a livable and viable world. Cooperations and alliances are a key to finding solutions. An in-depth and further elaboration of this concept by third parties is in the interest of the author.

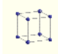
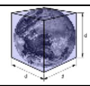
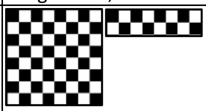
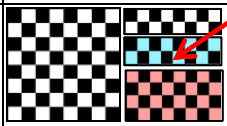
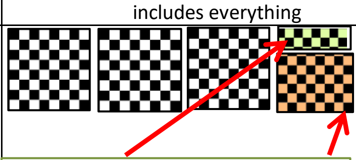
March 2022 / Dieter Hilti *chem.Ing.ETH, oec.HSG* *Mail: info@AIRvalue.ch*

16. Tabular overview of AIRvalue

			Data matrix		
	Information Focus:		**Content**		
CONCEPT	**Values => Solutions:** **Natural cycle =>** CO_2 (eq.) **Release by man =>**	**Actual / Target:** Very large & balanced; Risk: change of land use, forest fires... Goal: maintain functioning nature. Additive from oil, gas, coal; Goal: reduce, store, decarbonize processes.	**Reference variables:** • Air, CO_2, CH_4, N_2O.. • Air column => Cube • Volume & areas • ∑ weight+proportions • Geocoordinates **Target variable** : **Value transparency** via process calculations for better air protection.	**Principles:** Condense Generalize Assign Functions Calculate Assign Values See potentials Mitigate risks Impulse and courage for **nat. & tech. Solution**	**Views:** Top-down⬄bottom-up Analogies small ⬄ big Interdisciplinarity Company Nature ⬄ Man Networking, symbiosis and dependencies
	AirCol : 	AirCol: **Mass** identical Footprint Column ~100 km high; 1 million Kg (10^3 t)	AirCol: **Weight(t)** Hectare: $10^3 * 10^2 = 10^5$ t Km²: $10^5 * 10^2 = 10^7$ t Earth: $5{,}1 * 10^{15}$ t = 5'100'000 Gt	**CO_2**: ~280ppm **Nature** in 1 AirCol : ~420 kg	**CO_2: +135ppm man** Pro AirCol : ~ +205 kg additional CO_2 => Earth: in wt.%: ~1'050 Gt
	AirHus: 	AirHus: **Mass** Cube: 10m*10m*10m Space 100 m² Vol.= 1'000 vm³ Weight: 1,3 t Luft	AirHus: **Quantity per** Hectare: 100 Km² : 10'000	**CO_2: natural** ~280 ppm = Vol.% Air ~28.9 gr/mol CO2 44 gr/mol wt.% = 1.52 vol.%	**CO_2: antropogenic** Additional: 135 ppm ∑: ~415 ppm (2022)
	AirGrid		Earth: $5{,}1 * 10^8$ km² $5{,}1 * 10^{12}$ AirHus $5{,}1 * 10^{12}$ AirCol (id.)	**CO_2 Earth natural earlier** Vol.%: ~ 1'430 Gt CO_2 wt.%: ~ 2'170 Gt CO_2	**∑CO_2 Earth anthropogenic** ~ 3'220 Gt (+48%)
	AirValue (AV): 	+ Value consideration of positive **natural processes;** CO2 sequestering	+ Value assessment anthropogenic CO2 **abatement processes**	'-Value assessment Anthropogenic and natural CO2 **pollution processes**	**AV = f_{xy} * Me * 0.01 WE** f_{xy} = Factor combination Me =Quantity AirHus WE =Werteinheit/AirHus
AIR / CO_2	**CO_2:**	CO_2 ppm (Vol.%) = No. Air molecules / million Equilibrium Nature: 280 ppm: 1 <> ~3600; Imbalance 2022: 415 ppm: 1 <> ~2400	CO_2 **pro** geothermal heat: stabilizing greenhouse gas at natural ~280 ppm; balanced IR back radiation	CO_2 **pro** life: Carrier element in the carbon cycle of photosynthesis and cellular respiration with exchange dynamics Cf. red blood cells	CO2 **versus** life: Increased IR back radiation; destructive at 415 ppm and more... there is no going on like this (tipping effects).
	AIR:	1 atmosphere (at) = pressure 10m H2O = 1 Kg/cm2; 10 t/m2; = ϕ weight of dry air at sea level	On AirHus footprint of 100 m2 fits approx. 1600 sheets of DIN A4; 1 sheet = 630 cm2	Theor. space requirement CO2 on AirHus footprint to pre-industrial time: 2/3 DIN A4 = 420 Kg (280 ppm) (100m2 = 1600 sheets)	Actual situation 2021: CO2 over 3/3 DIN A4 = 630 Kg (415 ppm) => 210 Kg toS; Figurative: 210 plastic rods à 1cm2 and 10 m high too much
	additional greenhouse gases: (2020 values)	Methane **CH_4** Nitrous Oxide **N_2O** Water vapor **H_2O** (!) Carbon monoxide **CO** Other	CH_4 : ~ 28 * CO_2 eq N_2O : ~ 265 * CO_2 eq	1900 ppb (1.9 ppm) 330 ppb (0.3 ppm)	Approx. +15% since 1985 Approx.. +10% since 1980

STATE ATMOSPHERE → CLIMATE	Measuring points 2021 	Video: [Carbon dioxide pumphandle - 2021 - YouTube]  	CO2 concentration : 1958 .. 1979 .. 2021 and since time immemorial (NOAA Global Monitoring) J.Butller	Jan.2021: 415 ppm Jan.1979: 336 ppm ϕ ~ 2 ppm/Jahr before 1850: ~ 280ppm	Keeling curve ; Global Measuring Points, Continents & Poles; daily/annual CO2 increase/decrease
	Organism Earth (?)  **Organism** Creature	Dynamic cycles: CO2 cycle ↕ Bloodstream	Same sources / sinks		
	Energy balance 	**Irradiation:** 1.6 billion TWh per year	**World energy consumption** 160'000 TWh	Approx. Ratio: 10'000 <> 1	**Leverage** effect by changing the air envelope as a balancing filter
	Photosynthesis 	6 H_2O + 6 CO_2 + Licht → $C_6H_{12}O_6$ + 6 O_2	**Main nature process** O Vegetation O Biodiversity O Life ...	**CO2 cycle** (Cf. blood circulation) Dynamic day/night/year life-defining	
		Human processes: CO2 emitting GHG emitting Aerosols	Burdensome on Equilibrium		
CALCULATION	Appraisal of results : **NATUR company** **REAL company**	Processec => Products ↓ CO_2 lowering (plus +) ↑ CO_2 releasing (-)	Effect / Pricing Quantity: Willingness to pay Quantity: Cost	Function value: AV = fxy * Me * 0.01 WE similar (BI, ERP, OLAP...)	Purpose and objective: Recognizing value, **creating awareness** ⬇ **Protecting nature**
	Material flows as process results in quantity and time (OLAP)	**Nature: CO2**↓↑, O2↑ **fixing** or cycle: Vegetation Oceans Atmosphere Fire, volcaoes ...			
RELATIONS	**Waterdrop**  1 mm^3	Avogadro Constant = 6.022 * 10^{23} / Mol 1 Mol H_2O = ~ 18 gr = 18 cm^3 = 1.8*10^4 mm^3	Molecules in 1mm^3: = 6.02 * 10^{23} / 1.8*10^4 = 3.35 * 10^{19} = Quantity H_2O / mm^3	Assumption: each molecule is 1 mm3: 1 m3 = 10^9 mm3 1 km^2 à 1m = 10^9 *10^6 In 33500 km^2 (1m) => 3.35 * 10^4 * 10^{9+6} = = 3.35*10^{19} mm3	**Switzerland:** 41'285 km2 33500 / 41'285 = 0.81 => if each molecule were 1 mm3 in size, this would result in 0.81 meters over the whole of Switzerland, about half a year's rainfall.
	Organism creature  **Organism Earth** [75] «Living Earth NASA»[76]	Dynamic **Cycles**: CO_2 / O_2 Bloodcycle ↕ H_2O+CO_2 / O_2 cycles	**Cellular** connectivity Corresponding identical recycling Sources / Sinks	**Cycle** number respiratory and nutrient processes: Human: fast Planet Earth: slowly[2] (see: Video NOAA)	**Opportunity for climate:** **Consciousness human as part of bigger picture** **Unity in responsibility**

17. APPENDIX: Orientation grid Microworld ⇔ environment ⇔ Earth

	Cell (Micro)	Ambient world	Earth (Macro)
top-down View	⇦	⇦	⇦
bottom-up View	⇨	⇨	⇨
Zoom Monitoring	Microscopic Cell-oriented	Eye / Measuring stations Periodic testing	'Satellite observation / Aircraft / Measuring stations / Testing
Atoms Organism H,O,C,N,S,P,Mg,Na,Ca,K,..	Molecules / Cells / Genes	Man Nature Environment	Earth Sea Land Ice
Methodology	 Elementary cell	 AirHus (AirCube) 10*10*10m (by definition)	 ∑ Cubes about surface
Structure with similarity	Structuring by self-similar reproduction in self-regulation, small to large;	Iteration, structure, evolution... Diversity in molecular combination	Nature <> man natural & artificial systems; air envelope includes everything
exponential view: doubling atoms from field to field (4 checkerboards)	 64+16 Felder => = 2^79 = Avogadro constant = 6.022*10^23 = Atoms per 1 Mol	 Field 93 Man (Calculation: 6.022/**18***10^23 in 1 cm3 resp. 1 gr Water ....)	 Number of Atome by field 2^n: Field 201 = Earth; Field 256 => Stars
Micro => Universe	256 iterative steps with doubling are sufficient to identify each atom space-wide (2^256 encryption hash value)		
Time and processes	Principle: before > now > after (algorithm similar dependence of after on before; adaptive, recombinant)		
Systems	slow growing identity with iterative adaptations (genetics...)	Humans: rapid effect changes Nature: slow adaptive, symbiosis	Earth: symbiotic, life-giving air envelope, sensitive, filter against too high energy radiation of the sun
Organic systematics	Material and energy exchange in cells	Human: healthy organism supports stable temperature 37°C by burning fat cells and excreting; disease increases °C	CO_2 in natural equilibrium as basic substance of life and stabilizer of mean 15 °C; too much CO_2 in the organism earth increases °C (Agreement Paris 2015)
Relations	1 Cell contains about 100 trillion atoms / molecules[68]	1 mm3 'building material' sand contains as many atoms as the number of sand grains of the same size in a 64 cm thick layer on Switzerland.	Nature <> man natural & artificial systems; air e velope includes everything
Features	Cells, bacteria, reproduction, iterative fractal self-images	formal similarities in repetitive forms; complexity increase with size	same ratios of the golden section A/B = (A+B)/A = 1.618...
Processes	Interfacial processes (biological, chemical, physical)	Growth, life, death of natural and human kind	Irradiation Energy conversion Radiation (albedo)
Atmosphere	Fotosynthesis $6H_2O+6CO_2+e \Rightarrow C_6H_{12}O_6+6O_2$	strong annual increase (+~2,4 ppm), 135 ppm too much	Air envelope 21% O_2, 78% N_2, 0.4% CO_2,..
Energy	Energy and metabolism; conversion to nutrients,	160 Tsd TWh Consumption of mankind; around 2,500 kcal daily human requirement	INPUT Solar irradiation with 1.5 billion TWh approx. ~ 10'000 times > Consumption people; water cycle / wind / heat / growth
Greenhouse effect (leverage)	Effects biological, chemical, thermal	Threats to health, prosperity, livelihoods	Collateral effect CO_2 on air envelope => change of protective filter; environment
CO_2	Carrier molecule of C and O as the most important organic building materials of life	strong annual increase (+~2,4 ppm), 135 ppm too much	800 thousand years hardly changed; Keeling curve narrow corridor; Earth-historical almost vertical, exponential rise.
°C Instability	> ~ 1.5 °C strong negative impac	Balance runs out of control	globally increasing, measurable and tangible

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