THE EPICONOMY AND THE FUTURE OF EMPLOYMENT

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"Every revolution was first a thought in one man's mind."
Ralph Waldo Emerson

The Epiconomy starts with the marriage of ideas conceived by Adam Smith and Richard Dawkins. In the bible of the Economy, "The Wealth of the Nations", Smith honors us with a profound study of human nature, almost as if our justification for existence is the act of negotiation.

It is very interesting to observe the coherency of Smith's approach: if the generation of wealth has as its base a productive cycle, then it also bears a natural cost. Already in the XVIII century, Smith treats the environmental impact caused by a productive cycle as a diseconomy. Specifically, he deals with the scarcity of hunting and fishing as consequence of rampant exploitation. A great portion of Smith's monumental work refers to equilibrium: between demand and supply, price and cost, needs and desires.

Thanks to Aristoteles, we occidentals think in terms of lines, being logic the tool of this linear thought. And, logically, Smith is able to attribute a cost to every stage of a productive cycle. However, he humbly recognizes his incapacity of doing the same relative to the impact on nature caused by this cycle, for there are so many variables, factors and co-factors that we have no lines of action, and if there are no lines, logic cannot serve us, and without logic, there is no useful thinking. In other words, the "Wealth of the Nations" establishes the Economy, but it is absolutely impotent in respect to the Diseconomy.

In our proposition, this is where Dawkins enters. "The Selfish Gene" is a delicious book. It was published exactly 200 years after the "Wealth of the Nations", in 1976. Fundamentally, it is a young man's book, and as so, delivers a reinvigorating crunchiness and freshness. The surprising pleasure extracted from Dawkin's first book lies in its coarseness: we are animals. We´re not superior primates, we´re not special because we have opposing thumbs, we´re not excellent because we think. After all, there are animals that fly, shine in the deepness of the sea and that produce glass and polymers at ambient temperature. There are even animals that produce glue underwater. And my dog dreams.

It is amazing to be human. However, it´s not special. I can´t affirm of the totality, but a grand majority of animal species live in neutral productive cycles, since the waste of one cycle is food for the next. In other words, I think I can affirm that the human being is the only animal that produces garbage and that gives me the certainty that, in the chain of evolution, we are more or less, in the middle of the way.

Of everything that I have studied in life, where I really learned was in Switzerland. Clearly, I only reached so far because I had a fantastic mathematics teacher in the seventh grade, wonderful biology and chemistry teachers during middle school and an illuminated history professor in high school. I started university at the age of 16 and I´m eternally grateful to all those teachers that made me discover the pleasure of learning. But my mentor, the master that gave me vision was Valentine Telegdi, owner of a Wolf Prize in Physics, my advisor during my university extension in quantum mechanics at the ETH.

During the two years I spent with him, I never received one answer. Every time I asked something, he would respond with a "what do you think?", because for him, the great answers in physics would come from the young, without professional vices, without absolute certainties, without ego problems or careers to defend.

It is however good to remember that beyond learning a lot about life, Telegdi also taught me one or two things about physics.

Within quantum mechanics, we work with enormous quantities of data and uncertainty. In his book "Physics and Philosophy", Heisenberg brilliantly expounds his despair and that of his no less brilliant colleagues Planck, Bohr and Schrodinger, when confronted with the incongruences of quantum mechanics. I imagine that the meetings they had would resemble -in much- to group therapy sessions. It is starting with Heisenberg's "Principle of Uncertainty" that a heterodox method begins to delineate, for the treatment of these data and uncertainties. This method is contextualization. So in order that we establish a common ground of action: analysis is the direct descendent of Aristoteles, being defined as the process of decomposition of a complex topic in its most elementary parts, in a specialized form; whereas contextualization is the assessment of the interrelation of patterns, in a generalized form.

Revisiting Adam Smith, it becomes easy to understand the deepness of his analytical work that originates the Economy as the base of human association; but only from the context can we substantiate the Diseconomy.

Let´s take glyphosate as an example, which is the most widely used agricultural pesticide on the planet.

According to data of the chemical industry, during 2011, 650,000 tons of glyphosate were commercialized worldwide, generating a revenue of US$6.8 billion. The three major producers of herbicides based on glyphosate are Monsanto, with a 22% market share, Bayer, with a 19% market share and Syngenta, with a 16% market share. In a direct approach, solely with the sales of glyphosate based products, in the year of 2011, Monsanto grossed US$1,5 billion, Bayer, US$1,3 billion and Syngenta, US$1,1 billion. That is, 370,500 tons of glyphosate-based product responded to revenues in the order of US$4 billion.

But what is the value of the diseconomy caused by 650,000 tons of glyphosate?

Based on what has been written above, we move along Adam Smith´s distress: for 650,000 tons of glyphosate to have been produced, was there the use of any ore? If yes, what is the quantity of this ore left on the planet? What is the annual depletion rate? What is the reference used to determine the price of that ore? What is its production cost? If not, being it a chemical product, how is it produced? What are the prime materials used? Is there a system to measure the harm caused by this product? In truth, there are so many possible approaches to determine the environmental impact that it is not possible to -analytically- attribute a given value to the resulting diseconomy.

However, if we adopt contextualization instead of analysis, a whole new framework opens up to our comprehension.

When we deal with measurements related to global warming, it has become a convention to use CO_2 as the reference factor, with its global warming potential (GWP) being equal to I. From there, the GWP for all other greenhouse gases are calculated.

The same principle is used when we deal with the negative environmental impact caused by human beings. In doing so, we adopt the Life-Cycle Assessment (LCA) of the compound in question and calculate its corresponding Environmental Impact Potential (EIP). Through the fantastic job done by the University of Leiden, the Netherlands, we find the LCAs of more than 2000 compounds and their impact according to 141 possible scenarios.

In practice, let us take for example 1kg of glyphosate. This compound causes negative impacts on air, freshwater, marine water, agricultural soil and industrial soil.

In the **air**, we can measure negative emissions of 1kg of glyphosate in the following scenarios:

- Problem oriented approach: baseline (CML, 1999) Human Toxicity (HTP inf) – HTP inf. (Huijbregts, 1999&2000). In this scenario, the EIP of 1kg. of glyphosate is equal to 0.003099kg equivalent (kg_{eq}) of 1,4-dichlorobenzene. In this case, 1,4-

dichlorobenzene is adopted as the equivalent factor, analogous to what occurs with CO_2, which is taken as the reference for global warming.

- Problem oriented approach: baseline (CML, 1999) Freshwater aquatic ecotoxicity (FAETP inf) – FAETP inf. (Huijbregts, 1999&2000). In this scenario, the EIP of 1kg of glyphosate is equal to 22.932838kg_{eq} of 1,4-dichlorobenzene. In this case, 1,4-dichlorobenzene is adopted as the equivalent factor, analogous to what occurs with CO_2, which is taken as the reference for global warming.
- Problem oriented approach: baseline (CML, 1999) Marine aquatic ecotoxicity (MAETP inf) – MAETP inf. (Huijbregts, 1999&2000). In this scenario, the EIP of 1kg of glyphosate is equal to 16.808816kg_{eq} of 1,4-dichlorobenzene. In this case, 1,4-dichlorobenzene is adopted as the equivalent factor, analogous to what occurs with CO_2, which is taken as the reference for global warming.
- Problem oriented approach: baseline (CML, 1999) Terrestrial ecotoxicity (TETP inf) – TETP inf. (Huijbregts, 1999&2000). In this scenario, the EIP of 1kg of glyphosate is equal to 0.0465913kg_{eq} of 1,4-dichlorobenzene. In this case, 1,4-dichlorobenzene is adopted as the equivalent factor, analogous to what occurs with CO_2, which is taken as the reference for global warming.

In **freshwater reserves**, we can measure the negative emissions of 1kg. of glyphosate in the following scenarios:

- Problem oriented approach: baseline (CML, 1999) Human Toxicity (HTP inf) – HTP inf. (Huijbregts, 1999&2000). In this scenario, the EIP of 1kg. of glyphosate is equal to 0.066238 kg equivalent (kg_{eq}) of 1,4-dichlorobenzene. In this case, 1,4-dichlorobenzene is adopted as the equivalent factor, analogous to what occurs with CO_2, which is taken as the reference for global warming.
- Problem oriented approach: baseline (CML, 1999) Freshwater aquatic ecotoxicity (FAETP inf) – FAETP inf. (Huijbregts, 1999&2000). In this scenario, the EIP of 1kg of glyphosate is equal to 1,368.227175kg_{eq} of 1,4-dichlorobenzene. In this case, 1,4-dichlorobenzene is adopted as the equivalent factor, analogous to what occurs with CO_2, which is taken as the reference for global warming.
- Problem oriented approach: baseline (CML, 1999) Marine aquatic ecotoxicity (MAETP inf) – MAETP inf. (Huijbregts, 1999&2000). In this scenario, the EIP of 1kg of glyphosate is equal to 4.157106kg_{eq} of 1,4-dichlorobenzene. In this case, 1,4-dichlorobenzene is adopted as the equivalent factor, analogous to what occurs with CO_2, which is taken as the reference for global warming.
- Problem oriented approach: baseline (CML, 1999) Terrestrial ecotoxicity (TETP inf) – TETP inf. (Huijbregts, 1999&2000). In this scenario, the EIP of 1kg of glyphosate is equal to 2.247040kg_{eq} of 1,4-dichlorobenzene. In this case, 1,4-dichlorobenzene is adopted as the equivalent factor, analogous to what occurs with CO_2, which is taken as the reference for global warming.

In **marine water**, we can measure negative emissions related to 1kg of glyphosate in the following scenarios:

- Problem oriented approach: baseline (CML, 1999) Human Toxicity (HTP inf) – HTP inf. (Huijbregts, 1999&2000). In this scenario, the EIP of 1kg of glyphosate is equal to 0.000015kg. equivalent (kg_{eq}) of 1,4-dichlorobenzene. In this case, 1,4-dichlorobenzene is adopted as the equivalent factor, analogous to what occurs with CO_2, which is taken as the reference for global warming.
- Problem oriented approach: baseline (CML, 1999) Freshwater aquatic ecotoxicity (FAETP inf) – FAETP inf. (Huijbregts, 1999&2000). In this scenario, the EIP of 1kg of glyphosate is equal to 0.00000kg_{eq} of 1,4-dichlorobenzene. In this case, 1,4-dichlorobenzene is adopted as the equivalent factor, analogous to what occurs with CO_2, which is taken as the reference for global warming.
- Problem oriented approach: baseline (CML, 1999) Marine aquatic ecotoxicity (MAETP inf) – MAETP inf. (Huijbregts, 1999&2000). In this scenario, the EIP of 1kg of glyphosate is equal to 33.484579kg_{eq} of 1,4-dichlorobenzene. In this case, 1,4-dichlorobenzene is adopted as the equivalent factor, analogous to what occurs with CO_2, which is taken as the reference for global warming.
- Problem oriented approach: baseline (CML, 1999) Terrestrial ecotoxicity (TETP inf) – TETP inf. (Huijbregts, 1999&2000). In this scenario, the EIP of 1kg of glyphosate is equal to 0.000000kg_{eq} of 1,4-dichlorobenzene. In this case, 1,4-dichlorobenzene is adopted as the equivalent factor, analogous to what occurs with CO_2, which is taken as the reference for global warming.

In **agricultural soil**, we can measure the negative emissions of 1kg of glyphosate in the following scenarios:

- Problem oriented approach: baseline (CML, 1999) Human Toxicity (HTP inf) – HTP inf. (Huijbregts, 1999&2000). In this scenario, the EIP of 1kg. of glyphosate is equal to 0.014873kg equivalent (kg_{eq}) of 1,4-dichlorobenzene. In this case, 1,4-dichlorobenzene is adopted as the equivalent factor, analogous to what occurs with CO_2, which is taken as the reference for global warming.
- Problem oriented approach: baseline (CML, 1999) Freshwater aquatic ecotoxicity (FAETP inf) – FAETP inf. (Huijbregts, 1999&2000). In this scenario, the EIP of 1kg of glyphosate is equal to 0.921647kg_{eq} of 1,4-dichlorobenzene. In this case, 1,4-dichlorobenzene is adopted as the equivalent factor, analogous to what occurs with CO_2, which is taken as the reference for global warming.
- Problem oriented approach: baseline (CML, 1999) Marine aquatic ecotoxicity (MAETP inf) – MAETP inf. (Huijbregts, 1999&2000). In this scenario, the EIP of 1kg of glyphosate is equal to 0.002800kg_{eq} of 1,4-dichlorobenzene. In this case, 1,4-dichlorobenzene is adopted as the equivalent factor, analogous to what occurs with CO_2, which is taken as the reference for global warming.
- Problem oriented approach: baseline (CML, 1999) Terrestrial ecotoxicity (TETP inf) – TETP inf. (Huijbregts, 1999&2000). In this scenario, the EIP of 1kg of glyphosate is equal to 0.096342kg_{eq} of 1,4-dichlorobenzene. In this case, 1,4-

dichlorobenzene is adopted as the equivalent factor, analogous to what occurs with CO_2, which is taken as the reference for global warming.

In **industrial soil**, we can measure the negative emissions of 1kg of glyphosate in the following scenarios:

- Problem oriented approach: baseline (CML, 1999) Human Toxicity (HTP inf) – HTP inf. (Huijbregts, 1999&2000). In this scenario, the EIP of 1kg of glyphosate is equal to 0.000649kg equivalent (kg_{eq}) of 1,4-dichlorobenzene. In this case, 1,4-dichlorobenzene is adopted as the equivalent factor, analogous to what occurs with CO_2, which is taken as the reference for global warming.
- Problem oriented approach: baseline (CML, 1999) Freshwater aquatic ecotoxicity (FAETP inf) – FAETP inf. (Huijbregts, 1999&2000). In this scenario, the EIP of 1kg of glyphosate is equal to 3.671884kg_{eq} of 1,4-dichlorobenzene. In this case, 1,4-dichlorobenzene is adopted as the equivalent factor, analogous to what occurs with CO_2, which is taken as the reference for global warming.
- Problem oriented approach: baseline (CML, 1999) Marine aquatic ecotoxicity (MAETP inf) – MAETP inf. (Huijbregts, 1999&2000). In this scenario, the EIP of 1kg of glyphosate is equal to 0.011156kg_{eq} of 1,4-dichlorobenzene. In this case, 1,4-dichlorobenzene is adopted as the equivalent factor, analogous to what occurs with CO_2, which is taken as the reference for global warming.
- Problem oriented approach: baseline (CML, 1999) Terrestrial ecotoxicity (TETP inf) – TETP inf. (Huijbregts, 1999&2000). In this scenario, the EIP of 1kg of glyphosate is equal to 0.09kg_{eq} of 1,4-dichlorobenzene. In this case, 1,4-dichlorobenzene is adopted as the equivalent factor, analogous to what occurs with CO_2, which is taken as the reference for global warming.

This very tedious presentation of all possible perspectives (negative emissions in air, freshwater reserves, marine water, agricultural soil and industrial soil) and scenarios (human toxicity, freshwater ecotoxicity, marine ecotoxicity and terrestrial ecotoxicity) relative to glyphosate objectifies reaching the following conclusions:

From the point of view of negative emissions caused by **1kg of glyphosate in suspension (air)**, the diseconomies –within the impact scenarios- amount to **39.79134409kg_{eq} of 1,4-dichlorobenzene**;

From the point of view of negative emissions caused by **1kg of glyphosate released in freshwater reserves**, the diseconomies –within the impact scenarios- amount to **1,374.697559kg_{eq} of 1,4-dichlorobenzene**;

From the point of view of negative emissions caused by **1kg of glyphosate released in marine water reserves**, the diseconomies –within the impact scenarios- amount to **33.484594kg_{eq} of 1,4-dichlorobenzene**;

From the point of view of negative emissions caused by **1kg of glyphosate released in agricultural soil**, the diseconomies –within the impact scenarios- amount to **1.035662kg$_{eq}$ of 1,4-dichlorobenzene**;

From the point of view of negative emissions caused by **1kg of glyphosate released in industrial soil**, the diseconomies –within the impact scenarios- amount to **3.779647kg$_{eq}$ of 1,4-dichlorobenzene**;

As stated before, when we approach a complex issue contextually, instead of analytically, we can reach diverse conclusions, however always applying the same unit of measurement. Specifically in terms of glyphosate, we can conclude that the greatest negative impact is caused by its release in freshwater reserves, while its natural application in agricultural soil, causes the smallest environmental impact.

The contextual vision, albeit its difficult initial application, allows for the organization of complex systems and the apprehension of totalities that unveil the interrelationship of patterns. The amalgamation resulting from the reading of "The Wealth of the Nations" and "The Selfish Gene" added to my personal and professional experience led to the proposition that follows.

Continuing from where we left off, where I place the human being at more-or-less half of his state-of-the-art potential, in terms of presence on the planet, I would say that the Economy is at the same time the propeller shaft of this civilization and the endpoint for all possibilities related to this half of the human state-of-the-art potential.

We´re living on a planet with 7.5 billion people. Only today, 145 billion emails will be sent, among the 3.6 billion internet users. The world´s armed forces spend around US$3 billion per day while 743 million people are undernourished and of those, 25,000 die of hunger every day. Per year, we lose 1.8 million hectares of forest; 2.5 million hectares of land erodes; 4.2 million hectares of land desertifies; 2 quadrillion liters of water will be consumed this year, while 610 million people have no access to potable water. In addition, with current technology, we have oil for another 38 years and natural gas for 150 more years.

By the end of 2017, 5.8% of the world´s work force will be unemployed. This corresponds to 200 million people. The vulnerability rate of employment by the end of 2017 will be 46% and 65% of the children entering primary school will be getting jobs that still don´t exist today.

All these numbers refer to the Economy. The half of the way in our productive cycle.

The world´s GDP in 2015 was US$73 trillion and the diseconomies generated by the productive cycles that originated the GDP amounted to US$50 trillion.

Well, if we´re introducing the monetization of diseconomies, the pertinent question at hand is, "How did you arrive at US$50 trillion?" Easy. Laborious, but easy. Let´s take our glyphosate example again: we know that in 2011, 650,000 tons were commercialized, which corresponded to a gross revenue of US$6.8 billion. Parting from the principle that

glyphosate is a pesticide, let´s assume that 1% impacts the air, 95% agricultural soil, 3% industrial soil, 0.2% freshwater reserves and 0.8% marine water. With calculations based on the Environmental Impact Potential (EIP), we have:

- Air: 6,500,000kg x 39.791344 = 258,643,736kg_{eq} of 1,4-dichlorobenzene;
- Freshwater reserves: 1,300,000kg x 1,374.697559 = 1,787,106,827kg_{eq} of 1,4-dichlorobenzene;
- Marine water: 5,200,000 x 33.484594 = 174,119,889kg_{eq} of 1,4-dichlorobenzene;
- Agricultural soil: 617,500,000 x 1,035662 = 639,521,285kg_{eq} of 1,4-dichlorobenzene;
- Industrial soil: 19,500,000 x 3.779647 = 73,703,116kg_{eq} of 1,4-dichlorobenzene;

We have been able to accomplish the first part of the diseconomy process as proposed by Adam Smith by quantifying the environmental impact caused by an anthropic productive cycle –in this specific case- of glyphosate. Let´s now continue to the second stage.

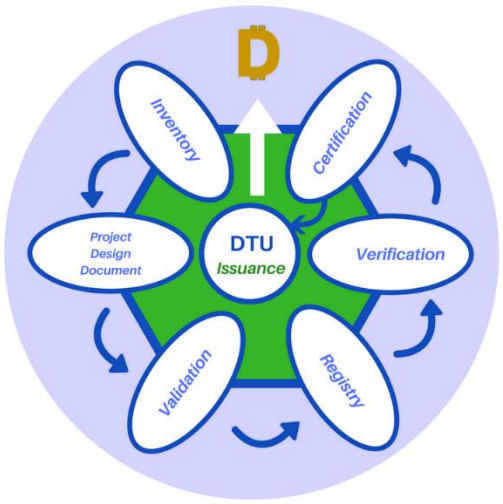
If the proposed scenario for the assessment of environmental impact caused by glyphosate uses 1,4-dichlorobenzene as the reference factor and this product has its roots solidly fixed in the universe of the Economy, then why not adopt the same factor as a price reference? Considering that the price of 1,4-dichlorobenzene orbits around US$2/kg (may/2017), the volume of environmental impact summed up as 2,933,094,853 kg_{eq} of 1,4-dichlorobenzene, represents a diseconomy of US$5,9 billion. With this line of reasoning, within Aristotelian logic, we arrive at the calculation of world diseconomies of the order of US$50 trillion/year, as counterpoint to the global GDP of 73 trillion/year (2015).

It´s very important to highlight the "mirror" condition of the Diseconomy. If in the Economy we have a GNP of US$73 trillion (2015) tending towards the infinite, in the Diseconomy we have –let´s call it- a Gross Environmental Impact (GEI) of US$50 trillion (2015) that tends to zero. In the Economy the cost is always inferior to the price, while in the Diseconomy, the cost (to the environment) is always greater than the price paid to remove the negative impact.

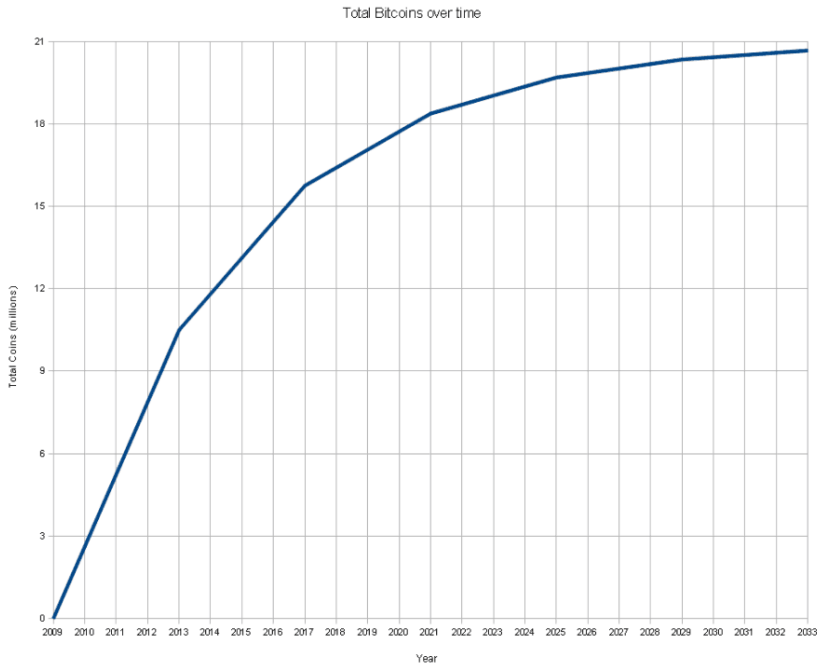
At last, we arrive at the interrelation of patterns. Considering the Economy the first stage of the human productive cycle and the Diseconomy as the second stage, that will lead us to the completeness of the process of ideal removal of all environmental liabilities, likening us to the grand majority of organisms inhabiting Earth, there´s a whole new market to be explored. For a long time we´ve known about petroleum reserves in the North Sea, however its exploration only commenced with the quadruplication of prices in 1973. If we have now found the way that leads us to the commercial exploration of diseconomies of our productive cycles, in an annual potential market of US$50 trillion, then it seems to me that the future of employment is assured.

It´s a fact that our notion of labor hasn´t changed for over 700 years and, next to guiding our lives, the prevailing maxim states that compensation is a function of an exchange for some type of service. Although a greater part of the physical removal of environmental liabilities will most likely be accomplished through heavy machinery and equipment, countries with lower levels of development will certainly encounter ways to compensate human operation. Ideal examples are the cleaning of the Ganges River or the Fresh Kills landfill, which would no longer be the highest mountain of the US East Coast. There are no limits to what can be achieved through the Diseconomy, with the experience we already possess with the Economy.

The operability of diseconomies should pass through a similar system as that of the generation of carbon credits. The ZerO2Nature standard is a wide and complex process that starts with the establishment of rules for the generation of ecological credits (Diseconomy Traded Unit or simply DTU), through corresponding methodologies, procedures, tools, guidelines and all that is necessary for the elaboration of a Project Design Document (PDD). There are six types of DTUs and they refer to the preservation of biodiversity (B-DTU), water (H-DTU), forests (F-DTU), ore (M-DTU), hydrocarbons (C-DTU) and energy optimization (N-DTU). Once a PDD is completed, it will become audited by a Designated Environmental Certifier (DEC), which will validate it or not. In case of a positive assessment, the PDD will follow to registration. From this point onward, DTUs start their production schedule. After a certain time, usually one year, the project proponent again hires a DEC to perform a verification against the plans of the proposed PDD. As a result of the verification process, a DEC produces a Verification and Certification Report. Once it´s established, beyond a doubt, that the PDD conforms to the actual situation, awarded DTUs issued by the ZerO2Nature standard, will be converted into DTUcoins (DTX) according to appropriate market oriented conversion rates and deposited into a current account, owned by the project proponent at the DTUcoin Bank. Next to operating as a currency, DTX have a special characteristic in that they are optionally removed from the market through retirement. For example, a mining company retires M-DTUs, while an oil company retires C-DTUs. Retired DTX subtract from the pool of specific ZerO2Nature DTUs, which are connected to the productive processes of companies.



In terms of a virtual currency, the DTX was created in 2015 as an evolution of the Bitcoin (BTC or XBT): the DTX has a physical underlying asset base and its generation occurs through the implementation of projects that remove measured quantities of negative anthropic emissions. In case of the Bitcoin: every ten minutes, the network that owns the currency creates and distributes a new lot (on no more than 50 BTCs) among the computers that run the mining program of coins. This new lot proposes a cryptographic challenge that involves many cycles of trial and error. Evidently, whoever possesses a greater processing power has a better likelihood for success. When the solution is found, the discovery is announced to the whole network and undergoes a validation process. In case the validation is positive, the winner receives a prize in BTC and the lot is added to the Blockchain (a chain of blocks resembling a cash flow log of public accounting). Between 2009 and 2012, 10,500,000 Bitcoins were created and after every 4 years the award for mining a new lot falls by half; this signifies that the maximum volume of Bitcoins in circulation should stabilize around 21 million.



The DTUcoin operates in a different mode.

There´s no way to prove that global warming is anthropic as there´s no way to prove that it is not. All that concerns the Planet is based on scenarios, since there´s no possible way to enclose the Earth in a laboratory and empirically prove theory A or B.
What is possible and what surprisingly enough we have never tried, is to remove our tangible and measurable negative environmental impact. We do not know if society as we know it would survive an atmospheric CO_2 concentration of 0.06%; we do not know if the increase in CO_2 level in the atmosphere occurs because of our activity on the Planet or if it is caused by the Sun. But we do know that the Ganges river has clogged entirely due to the enormous amount of waste deposited there; we know that there´s a huge spot of garbage on the Pacific Ocean, covering an area of almost 700 thousand km^2. Likewise, we know that due to the accident in Seveso, Italy when the tanks of TCDD (2,3,7,8-tetrachlordibenzo-p-dioxin) at the ICMESA plant ruptured, causing the death of 3,000 animals and the sacrifice of another 70,000, the "Seveso Parameter" was established, which determines the reach and gravity of environmental contamination.

The intangibility of the carbon credit is certainly tied to the scientific perspective adopted by the IPCC. By treating global warming as anthropic, we bring into our calculations the unmeasurable and unknown complexities of Nature and form there, we lose ourselves in philosophical discussions for or against that or the other theory.

Taken in anthropic scenarios, DTUs are absolutely tangible and lead us to DTX. We can generate DTUs from water (PREHYDRO projects), ore (PREMIN projects), hydrocarbons (PRECARB projects), the reduction of emissions from industrial processes (PRONER projects); we can generate credits by preserving biodiversity (PREBIO projects)

and forests (PREFOR projects) if, instead of attempting to embrace the immensity of the sophisticated natural processes, we deal with comprehensive human totalities.

In our quest to insert human productive cycles into comprehensive contexts, we will be able to adapt our linear Aristotelic thought to the complexity of systems, without losing ourselves on the way.

All anthropic productive cycles are measurable and reversible. The fact is that the final product of such a cycle causes eco-impacts, that most of the time are negative. These impacts or diseconomies, have up till now, been dealt with as intangible. As we reduce our negative eco-impact to the dimension of an anthropic productive cycle and contextualize it with its spatial localization, we´re not doing anything beyond adopting a scenario. Well, if we have at our disposal 104 Life Cycle Assessment (LCA) scenarios to choose from and insert the diseconomy resulting from an anthropic productive cycle into the most adequate scenario(s), we´re able to make the diseconomy tangible, with the simple adoption of the market value for the reference factor adopted by the scenario(s) in question.

Exemplifying, let´s take the global gold reserves: in the baseline scenario CML, 1999, of abiotic depletion of the last-last reserves of elements – ADP elements (Guinee et al. 2001), the reference factor is 1kg of antimony equivalent. In this scenario, the global abiotic depletion rate for gold (for the reference year 2000) is 1.35E+8, while its annual emission rate is in the order of 2.59E+6, therefore the EIP of gold equals 52 (depletion rate divided by the annual emission rate). In other words, the monitored preservation of 1kg of gold ore, according to the ZerO2Nature standard and within the parameters established by the methodology, generates 52 credits of the PREMIN type. Since the scenario in question adopts antimony as the equivalency factor, by establishing the relationship of this diseconomy with the global economic scenario, where in 2016 antimony sold at US$5.028/kg (New York dealer price for 99.5% to 99.6% metal, c.i.f. U.S. ports), we arrive at a market value of US$261.46/kg, relative to the abiotic depletion rate of last-last reserves of gold, at its baseline.

A simple change of perspective, suggested by the ZerO2Nature standard, can consubstantiate an entirely new approach with respect to the financial treatment of diseconomies, attributing tangibility and consequently, market value.

But what is the comparative parameter to evaluate the ZerO2Nature standard? To those familiar with the UNFCCC Clean Development Mechanism (CDM), we recommend a direct comparison – point by point – where the conclusion would be that ZerO2Nature mirrors the technical-scientific conception and implementation rigor of the CDM. However, ZerO2Nature proposes to advance where the CDM opts to stop: the ZerO2Nature system transforms offset diseconomies in currency.

To those not familiar with the flexibilization mechanisms of the Kyoto Treaty, the suggestion is to compare ZerO2Nature with the ISO standards. More specifically, with the ISO 14000 family of norms. In this case, we can observe that while the ZerO2Nature standard applies to the removal of negative anthropic impact on the environment, ISO refers solely to green-house gases; while ISO14064-1 proposes (in Para. 2, 2.7) a limited or reasonable confidence level for validation and verification of green-house gas inventories, ZerO2Nature proposes on-site validations and verifications through the determination of proven objective evidence; while the ISO norm recommends the quantification of green-house gases, the ZerO2Nature standard only accepts a project with measured and accounted negative emissions.

We can claim that ZerO2Nature is a standard that brings with it all the consistency and technical-scientific rigor apprehended from the CDM, applied to the flexibility and level of comprehension that the marketplace expects in order for a product to be adopted. If the Bitcoin revolutions the traditional Economy, the DTX evolves it and opens the doors to the Diseconomy market.

If the collateral of the Bitcoin is the real expenditure of electricity and the processing capacity of computers, the DTX has its underlying physical base with the measured removal of anthropic emissions (or diseconomies) in contrast to Fiat currency, that ever since Bretton-Woods, does not possess an underlying physical base. Someone who wishes to negotiate Bitcoins needs to use an online wallet, while trades in DTX occur through an on-line bank, the DTUcoin Bank. It is important to note that this is not a regulated market and does not possess a deposit guarantee agent. It´s possible to obtain Bitcoins in three ways: by mining, through the sales of goods and services and by the direct purchase off other holders or virtual exchange websites. Similarly, it is possible to obtain DTX through generation (ZerO2Nature project activities), direct purchase or through the sale of goods and services and accepting DTX at exchange value. Both in the Bitcoin and DTX systems, the buying and selling orders are executed directly by users, while the website that announces goods and services in exchange for DTX is generally responsible for the effective delivery of those goods and services. In the case of Bitcoin, the security of payments and wallets are guaranteed by a system of two passwords: the public key, which permits anyone to transfer Bitcoins to a specific wallet and the private key, which solely gives the owner of the wallet authorization to transfer the currency. A trade is only effective when a buyer digitally signs off on the transfer with his private key. Since all the computers of the network are informed about each trade, any attempt of fraud or theft is immediately perceived by the p2p network (pair to pair or point to point, is the interrelationship of computer networks where each computer unit is a the same time the client and the server, which guarantees a greater multiplicity of data sharing, without the need for a centralized server). The security of the Blockchain system is such that many traditional banks are already migrating to this type of operation. However, it is evident that virtual business models are an enormous attractive for hackers; either because of the conquest of a challenge or because of pure dishonesty, with the unlawful appropriation of value.

Bitcoin and DTUcoin: currency or commodities?

Due to the hybrid and innovative nature of digital p2p currency, some apparently intuitive questions should be raised, in order to define parameters that guide the research. Comparably to fossil-fuel complementary energy sources, both the Bitcoin and the DTX do not have a competitive character vis-à-vis the Fiat currencies. Moreover, another important aspect would be the market definition for these new instruments. The internet facilitates the direct connection between people from all over the world, which eases the exchange and sharing of information in an up to now, unusual way. The Bitcoin arose with the objective to create an alternate payment system, one that could remove financial intermediaries –both public and private- from business transactions. Upon the proven and uncontested success of this new market approach, the DTX evolves the Bitcoin, bringing with it all the liberty and flexibility of the p2p market and going beyond, with its underlying physical base and the pristine and elegant answer to the question posed by Adam Smith: what is the monetary value of diseconomies caused by productive cycles? In other words, with the clear, simple and effective monetization of environmental impacts, a new market occurs, where onto the Economy of the productive cycles, we add the Diseconomy, defined by the monetary compensation for the accounted removal of negative environmental impact caused by humans. Within this new financial system we encounter the Epiconomy, that literally goes beyond that what we today call the Economy. The Epiconomy is the sum of all the business models of the Economy and of the Diseconomy; with financial results that fall short of the duplication of the world GDP. The direct and irreversible consequence of the massive use of the DTX is an ever increasing cleaner world.

In its elegant existence, the DTX fulfills five conditions that define a currency:

1. It is a form of payment;
2. A value reserve;
3. A unit of price reference;
4. It is divisible;
5. It is easily handled.

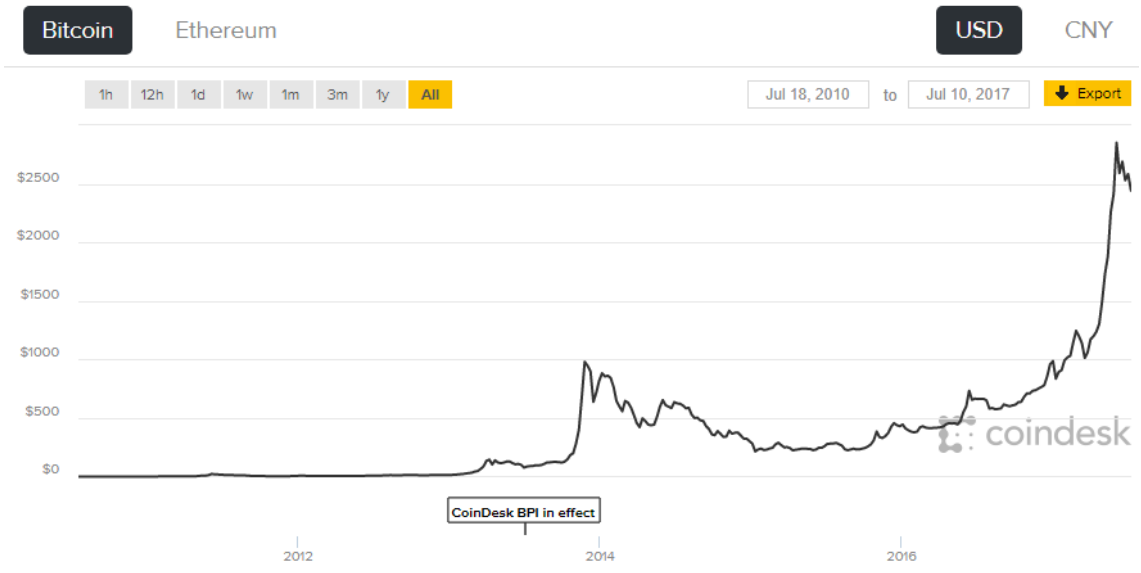
Both the Bitcoin and the DTX are characterized by intrinsically international phenomena. Having this in mind, how should we evaluate the degree of liquidity of the Bitcoin and the DTX? There´s no central authority officially responsible for the regulation of the market that guarantees its value or promotes its acceptance; but hundreds of millions of people exercising this role without the possibility of data manipulation and power abuse. Added to this an ever increasing ecological conscience on the part of the consumer and with difficulty we could count on a cataclysmic scenario for the DTX.

Properties of the complementary currencies

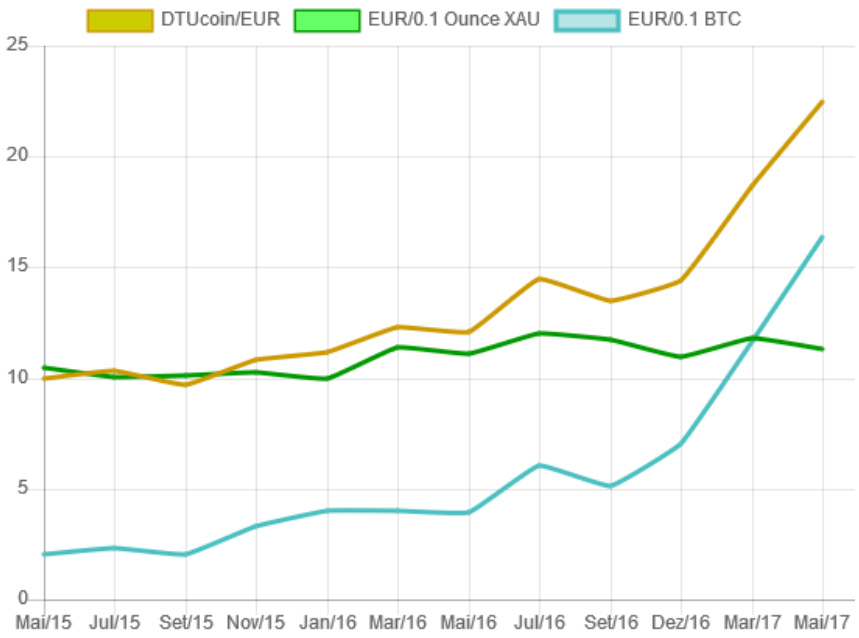
We are all lazy. Demonstrably so. Biologically, we are submitted to stasis, a state of stability in which a species tends to difficulty in exiting from a genetic inertia.

We are aware of this tendency from the beginning of our morning routine until the moment we lay down to sleep: the human being is a creature of habit. How do we explain then, all that we invent and continue to invent?

Simple. We possess the capability of surprising ourselves with something to such an extent that the genetic inertia is overpowered, and from that point onwards, we become unstoppable. And every time we create something new, we also create the need for adequacy. For example, with the virtual currencies. It is a fact that the decentralization of the monetary system generates a framework where flexibility is the rule. We can do business with the entire world, at any time and without manipulations or cartelizations. The State can no longer freeze our money or deprive us of assets. The market rates are a natural result of this new status quo and not the consequence of abusive taxation necessary to the compensation of incompetence, ill administration or simple corruption. It is evident therefore, that this scenario does not interest many governments. In 2015, the Netherlands a group of countries in a strong campaign attacking the Bitcoin, with many articles in the press covering the use of the coin in the "dark internet", for trafficking of drugs, illegal weapon sales, prostitution and human slavery. As a result, the value of Bitcoin went from US$1,112.00 in November 2013 to US$228.00 in May 2015. With time, people caught on to the manipulation by governments and financial institutions and from June 2015 onwards, the value of Bitcoin has been increasing solidly. On May 12, 2017, one Bitcoin was traded at US$1,823.00. In July 9, 2017, one Bitcoin was traded at US$2,575.89.



Currently, the DTX market is valued at US$12 million and the currency can be traded at www.EcoMoney.eu. Furthermore, the e-commerce site IBIOX (www.ibiox.com) is the first on-line store to accept DTX for the purchase of high-end goods.



As stated before, all virtual currency, like Bitcoin and DTX, are complementary to national Fiat currency until the State starts accepting such alternatives for the payment of taxes and fines. Once our genetic inertia becomes overpowered, it is certain that the popularity and trust of Bitcoin and DTX will grow rapidly, marking a real evolution in payment options.

Economy and the end of employment

At the start of this proposition, I adopt the perspective of a human being as an animal with a productive cycle to accomplish and –different than all the other organisms that inhabit the planet- its current inability to deal with the environmental liabilities produced by this cycle. From this point forwards, I think that we can recognize the Economy as an intrinsic factor of human productivity and, in so being, the relationship between pollution and the end of employment seems to me, very coherent.

In the book "The Human Condition", Hannah Arendt brilliantly tells us about the possibilities of active life within our civilization. For her, the possible activities of humans are labor, work and action crossing four possible universes: the political, social, public and private.

Arendt defines labor as "the activity that exists to produce all that is vital to man, where he takes from nature all that is necessary for the maintenance of life". Labor has a biologic character, being much more connected to instinct than to the capacity of thought. Although being a repetitive cycle of "toil, consumption and regeneration and toil again", labor is the foundation of the human condition for the maintenance of life.

Moreover, work is the application of man and its capacity to transform Nature. It´s through work that humans create a gap between themselves and Nature, an artificial world

that ends up turning into a reality. The objects of work survive their creator and this possibility becomes the mainspring of man, placing all hope in the perpetuity of their oeuvres, attenuating the anguish of death.

Finally, action is for Arendt, the noblest of human activities, that which aims for the common good; establishes ethics and exercises its resulting virtues; searches for illumination through its own amelioration. Action is the sole activity among humans without the need for matter, being the gift of the word the maximum expression of the human capacity for thought.

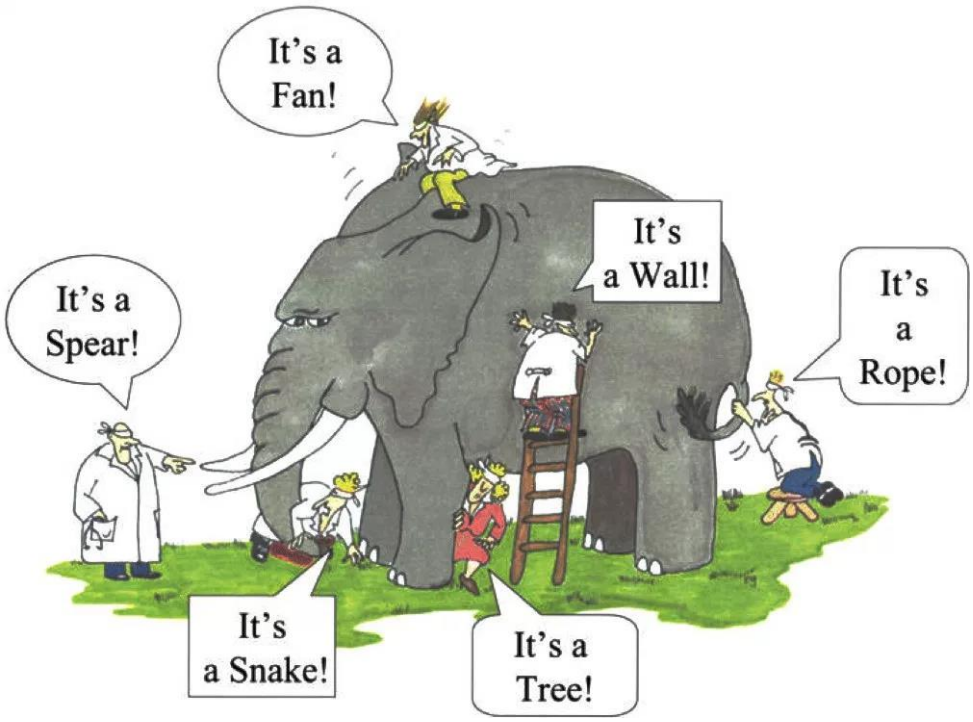
It´s interesting to observe that among Arendt´s three human conditions of activity, work is for us the dearest. If labor is necessary for the maintenance of our lives and action permits social interaction, it´s in work that we encounter the pacification of our nontransferable and imminent personal death.

In the last century, the United States watched their rural workforce drop by 41% to 2%, due to the evolution in the employment of machinery and chemical products, both in cultivation as in the harvest. Towards the late 1940´s, more than 350,000 phone operators were working at AT&T alone; today there are as few as 10,000 in all of the USA. In the 1950´s, thousands of elevator operators lost their jobs, when technology made it possible for passengers to choose their own floor. During the 1960´s, the dockers became obsolete, with the advent of cranes and containers that completely overhauled the shipping industry.

Until then, the outgrowth of manpower was applauded; after all, the world was living a time of economic flourishing and the telephone and elevator operators quickly found new job placements. As for the dockers, who performed extremely heavy work that much resembled slavery, they became absorbed by the Production of that time and from a social standpoint, the modernization of the docks was a relief.

1961 is the year that marks the creation and employment of the first robot in the industry. The welding process at a GM plant in New Jersey hires the Unimate. Concomitantly, computers are introduced to factory operations and now, it´s no longer manpower, but man who has become obsolete.

It has been estimated that until 2040, close to 70% of all current jobs will no longer exist and there are abysmal doubts about the future of employment, as a result of an increase in world population, greater life expectancy or technological advancement. Nevertheless, the great truth is that most governments and their designated departments have been dealing with the issue as an elephant and a group of blind men: a gigantic problem, apparently without any solution, where each part is seen as most comforting, and the discussion of the whole is entirely ignored.



Epiconomics and the future of employment

During the end of the XIX century, the Economy of petroleum begins. In 2016 the world produced and consumed 98 million barrels of crude oil per day. During the same year, the markets traded circa 480 million barrels daily. The product is bought and sold, innumerous times, by people that have never seen a barrel of oil in their lifetime. We live the petroleum era because this is the strongest commodity of the Economy. At NYMEX (New York Mercantile Exchange), future oil contracts are negotiated until 2032. Obviously, this market only exists because every day there´s a minimum availability of 700 thousand barrels of crude oil of the WTI type in Cushing, Oklahoma; at the port of Rotterdam, Netherlands, a minimum availability of 300 thousand barrels of the Brent Blend; the port of Fateh, United Arab Emirates, disposes of 200 thousand barrels of crude; while 80 thousand barrels of crude are available at the terminal of Kerteh, Malasia. WTI, Brent, Dubai and Fateh are the principal petroleum references in the oil market and all the other 35 types of crude produced in the world, have their prices established according to those four. But when we return to the foundation of Adam Smith´s work, where he affirms that production is the base of the country´s wealth, we can understand the philosophical solidity of the Economy. It's the existence and real possibility of physical use of these reference-oils, their potential benefit, resulting in products of human utility and –above all- our blind faith in these facts, that allows for the transformation of a Smithian economic scenario, where the generation of wealth involves the sales of 98 million barrels/day, into a Croesian economic scenario, where the generated wealth is the offspring of 480 million barrerls/day.

Nonetheless, this quintuplication of economic wealth charges its price. Directly, Production causes the depletion of ore, pollution, soil impoverishment; indirectly and

ironically, it is the technological advancement that promotes the end of employment through the obsolescence of the human being.

The flourishment of the Diseconomy is the way that will allow humans to complete their productive cycle. With the monetization of diseconomies, the negative emissions of one productive cycle cease to become waste and become raw materials for another cycle, uncurtaining infinite possibilities. Analogous to the way in which companies began producing oil in the North Sea, once the cost-benefit relationship becomes favorable, diseconomies with absolute attributable market values, will demand studies, transformative ideas, new technologies and manpower. The completeness of the productive cycle of man on the planet will result in an Economy and a Diseconomy integrating into an Epiconomy, with a world GDP easily surpassing US$120 trillion/year.