PLASTIC POLLUTION OF THE WORLD OCEAN IS MUCH MORE DANGEROUS THAN WE THINK

ADGEX TECHNOLOGIES

THE MOST EFFECTIVE WAY OF SOLVING THE PROBLEM!

HUMANITY SHOULD
THINK AND UNDERSTAND!!!

THE FURTHER ACCUMULATION AND INCREASE OF GARBAGE IN THE OCEANS CAN CAUSE DEATH OF THE PLANET AS A WHOLE

1. IMPACT OF OCEAN WASTE ON CLIMATE CHANGE ON PLANET EARTH

Massive pollution of the world's oceans began from the time when people invented plastic (the second half of the 20th century) and began to actively introduce it into their life. Despite the usefulness of this type of product in industry and in everyday life, this "achievement of civilization" in natural conditions decomposes for more than a hundred years (and taking into account the HCC content, this period reaches millions of years). A single water basin is therefore one - the plastic thrown into any river or sea, thanks to ocean currents, gets lost in huge islands. In fact, plastic has become a victim of the scourge of punishing humanity's own success.

To date, a total of 8.3 billion tons of plastic have been produced worldwide. Of this, approximately 6.3 billion tons are now garbage, 79% of which is in landfills or in the environment. If at the end of the 20th century the content of garbage in the ocean was estimated at 400 g / km², then by 2015 it was already 1230 g / km², and in 2020 it exceeded 2000 g / km². The number of small particles is estimated at more than a trillion, and large ones account for 93% of the total mass. In total, this mass, toxic to the ocean, is at least 79 million tons. The size of the center of the largest garbage patch is estimated at one million km2, and the periphery extends to another 3.5 million km2.

Pic. Zones of debris in the oceans located by the space satellites

The problems of anthropogenic impact on the planet's water resources has a number of interrelated consequences that affect global climate change. However, the following factors are the most significant in the process negative for the climate balance:

1. Reducing the area of evaporation in the area of garbage spots
2. Change in the force of surface tension of sea water
3. Change in COD of water
4. Change in the electric charge of water and change in the cloud formation process
5. Change in the redox potential of water in the ocean
6. Change in the electrical resistance of water and the formation of electromagnetic vortex fields

1.1. REDUCTION OF THE EVAPORATING SURFACE

In the ocean, water evaporates from the surface at any temperature, but with an increase in water temperature, the evaporation rate increases. The higher the water temperature on the ocean surface, the greater the number of rapidly moving molecules that have sufficient kinetic energy to overcome the gravitational forces of neighboring particles and fly out of the water. The volume of evaporation depends on the area: the larger the area of the free surface of the liquid, the more molecules simultaneously fly into the air. At the same time, the average kinetic energy of the molecules remaining in the liquid becomes less and less. This means that the internal energy of the evaporating liquid decreases, the liquid cools.

Debris floating on the surface (especially in patches of debris in the ocean) significantly reduces the evaporation surface. If earlier in this part of the ocean, due to the process of evaporation, there was a process of decreasing water temperature, then at the moment this process is absent. Unfortunately, this factor is gaining momentum more and more and has an irreversible impact on the global warming process.

CONCLUSIONS:

In the presence of floating debris on the surface of the ocean, the natural ocean / atmosphere balance, which has developed over millions of years, is disturbed, in which:

- Ocean water temperature in spots tends to increase
- The evaporation area is reduced, which reduces the amount of evaporated water

1.2. CHANGE OF SURFACE TENSION FORCE

It is known that at a water temperature of 20 C the surface tension of an aqueous solution of sodium chloride (the main component of seawater) is 85 x 10 -3 N / m2. Due to the abundance of debris on the ocean surface in areas of garbage spots, ecologists and scientists began to observe a decrease in surface tension:

№ spots	Ocean	Temperature C0 Min – Max	W surface tension (Н/м2) In the open water winter/summer
1	Northern Pacific ocean	11, 7 – 14,2	22 x 10 -3 /40 x 10 -3
2	Indian ocean	16,0 – 23,0	45 x 10 -3 / 88 x 10 -3
3	Southern Pacific ocean	12,5 – 17,0	30 x 10 -3 / 75 x 10 -3
4	Southern Atlantic ocean	13,0 – 18,0	33 x 10 -3 / 78 x 10 -3
5	Central Atlantic ocean	17,0 – 25, 3	75 x 10 -3 / 92 x 10 -3

Vapor molecules located near the surface of a liquid can be attracted by its molecules and return to the liquid again. Both processes always occur on the surface of a liquid: evaporation and condensation. A decrease in the surface tension force leads to an enlargement of the particles of the evaporated water (vapor), which allows us to assume their weak "volatility", leading to an even greater decrease in the evaporation process.

1.3. CHANGES IN COD

COD – chemical oxygen consumption. The COD value includes the total content of organic substances in the liquid in the volume of bound oxygen consumed for their oxidation. COD is a general quantitative indicator of water pollution, which is one of the most informative and detailed.

During the decomposition of components of organic chemistry (and partly of plastic), complex-organic (including complex-oxidized) compounds pass into salt water, which leads to an increase in COD at least tenfold due to an increase in DOM (dissolved organic matter). In the ocean water in the area of garbage spots, oxidation reactions take place with the absorption of oxygen dissolved in the water.

THIS LEADS TO THE FOLLOWING PHENOMENA:

- Lack of biological life in water with high COD (phyto and zooplankton)
- Exclusion of the ocean area from the process of oxygen release into the atmosphere (the lungs of the planet)
- The absorption of oxygen from the atmosphere, resulting in the formation of a chemical (oxygen) depression funnel.
- Increase in electrical resistance of water (decrease in electrical conductivity)
- Formation of conditions under which the ocean / atmosphere system strives to make up for the lack of oxygen (these conditions have not been studied, but a priori cause a certain directed flow of oxygen molecules in the air).

1.4. CHANGE IN THE ELECTRIC CHARGE OF WATER AND CHANGE IN THE CLOUD FORMATION PROCESS

Of the numerous mesometeorological processes, convection plays the most important role in the atmosphere, which leads to the formation of cumulus and cumulonimbus clouds. Cumulonimbus clouds account for a significant proportion of precipitation in temperate latitudes and prevailing in equatorial-tropical ones. Free convection, that is, the maximum height of rise of water particles evaporated from the surface, corresponds to the level at which the areas of the "positive" and "negative" regions become equal to each other. This occurs when the stratification (vertical stratification) of the atmosphere is unstable.

The clouds of the lower tier (below 2 km), the middle tier (2 ÷ 6 km) and the upper tier (above 6 km) are distinguished by the base height. According to the phase structure, clouds are distinguished: water (drip), ice, or crystalline, and a mixed structure.

During phase transformations steam – ice, steam – water, separation of electric charges is observed, which is attributed to an important role in the formation of atmospheric electricity. Back in the 1770s. A. Volta demonstrated an experiment that proved that

electricity arises "from simple evaporation of water" and that the vapor is charged positively. Repeating the experiments of A. Volta and diversifying them, T. Cavallo found that the higher the amount of charge, the more intense the evaporation (Cavallo, 1779). In addition, a temperature difference applied to the boundaries of a certain system is capable of generating an electric current in it (Seebeck effect). Protons and hydroxide ions arise in vapor due to thermal ionization of water molecules, and also enter vapor from water during interfacial exchange of particles. Their concentration, based on the experimental value of electrical conductivity σ = 10–13 Ohm – 1·m – 1 and the value of the diffusion coefficient D = 10–7 m2·s – 1 [Babichev et al., 1991], can be N pairs = (σ / D) * (kT / e2) = 1.5·1011 m – 3, where k is the Boltzmann constant; T is temperature, K; e is the electron charge.

CONCLUSIONS:

- Interphase separation of electric charges during evaporation from the surface of a water composition with a high COD value occurs on charge carriers - hydroxide ions, which provides a positive charge of water during evaporation.
- Positively charged particles of water (vapor) have low kinetic energy (ascent rate), which ensures the formation of mainly the lower layer of clouds (below 2 km), which are unable to travel long distances.
- The map of precipitation is changing. This is especially true in areas where rainfall was previously dominated by garbage-free and now contaminated parts of the ocean. That is, where there were earlier rains, it becomes dry, and where droughts prevailed earlier, precipitation falls.

1.5. CHANGE IN THE REDOX POTENTIAL (EH) OF THE SURFACE LAYERS OF THE WORLD OCEAN

Factors of Eh formation: Natural waters contain ions of different valence and neutral molecules of the same element, which constitute a separate redox system:

- Oxidative - characterized by values of Rx> + (100 - 150) mV (pure seawater has an ORP from +100 to +200 mV), the presence of free oxygen in water, as well as a number of elements in the highest form of their valence (Fe3 +, Mo6 +, As5-, V5 +, U6 +, Sr4 +, Cu2 +, Pb2 +).
- Transient - determined by Rx values from 0 to + 100 mV, unstable geochemical regime and variable content of hydrogen sulfide and oxygen. Under these conditions, both weak oxidation and weak reduction of a number of metals occur.
- Reducing - characterized by Rx <0. This system is typical for waters where metals of low valence (Fe2 +, Mn2 +, Mo4 +, V4 +, U4 +) are present, as well as hydrogen sulfide. While the upper layers of water acquire acidic properties, the value of the redox potential decreases.

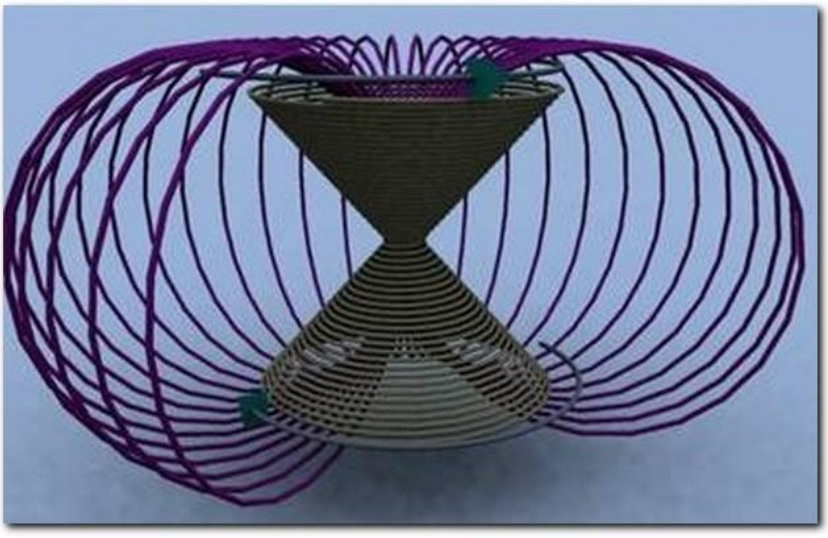
CONCLUSIONS:

- A change (decrease) in the redox potential of the surface layers of the world's ocean water occurs due to its anthropogenic pollution.
- Redox potential in the area of garbage spots decrease sharply. The greatest impact is exerted by pollution with complex organic compounds, because this type of compounds is not oxidized and mainly reducing chemical reactions take place in water.
- In the area of garbage spots, a static discharge is formed, similar to a depression funnel, which causes counter processes from the side of ocean currents, which are aimed at restoring the redox potential of water.

1.6. CHANGE IN THE ELECTRICAL RESISTANCE OF WATER AND THE FORMATION OF ELECTROMAGNETIC VORTEX FIELDS

Vortex currents, or Foucault currents - eddy induction volumetric electric current that occurs in electrical conductors when the flow of the magnetic field acting on them changes over time.

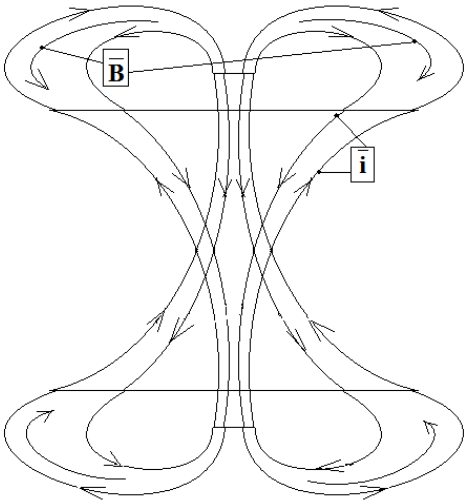
Since the electrical resistance of a massive conductor, which is the World Ocean (the higher the salinity, the greater the conductivity) can be small, the strength of the induction electric current caused by Foucault currents can reach extremely high values. Since Foucault's currents represent an electric current in the volume of a conductor (water), then due to the objectively available generator of electromagnetic waves (the planet's magnetic field), the currents on the ocean surface become stronger than in the depths (skin effect). In this case, the greatest stability and duration of life in nature has a short vortex - this is a torus, in which all energy is concentrated in small volumes, and in which in nature energy is not spent on overcoming the friction of the walls of the vortices on the medium.



Pic. View of the Earth's electromagnetic field without debris in the ocean (traditional torus)

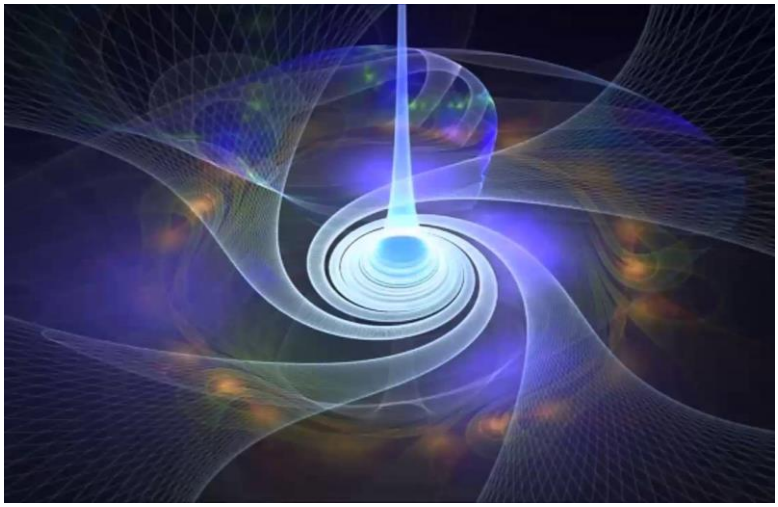
In the area of garbage spots, due to the constantly increasing number of tons of plastic microparticles on its surface and in the water column, the redox potential of water changes. The electrical conductivity of a volume of water (salt water is an electrolyte and plastic is a dielectric) drops and decreases with the amount of plastic. In this case, the electric charge of the field changes towards negative values and a vortex effect is created, in which (in accordance with Lenz's rule) Foucault's currents in the volume of water, which is a conductor, choose such a path that to the greatest extent oppose the reason that causes their flow.

In simple words, the natural torus of the Earth's electromagnetic field, due to the presence of suspended plastic micro particles on the surface of the water and in its thickness, begins to stretch. Its graphic model of the torus is changing and already looks like this:



Pic. View of the torus on top of debris spot

As a result, due to garbage spots on the ocean surface, today the graphic model of the Earth's electromagnetic field as a whole look like this:



From the above, a conclusion should be drawn about the causes of vortexes / tornadoes in various parts of the planet.

Most of all in the world, the cause of tornadoes is considered a thunderstorm, or rather thunderclouds, which form fast-moving air currents, which subsequently form a funnel, slowly extending to the surface of the earth. At the same time, all sources claim that this phenomenon has been little studied and that there are significant disagreements among climatologists.

Another understanding is acceptable that this effect, caused by Foucault currents, allows one to form a hypothesis about the real origin of tornado-tornadoes, which are formed with constant periodicity at different points of the planet.

The standard and constantly occurring natural phenomenon of the detachment of massive blocks of ice from glaciers, known as the Iceberg, has a similar effect due to the fact that, moving to warmer climatic zones, due to the melting of the iceberg, a sufficiently large volume of fresh water forms around it, which changes the redox - potential, surface tension force and sharply reduces its electrical conductivity. This leads to the formation of vortex funnels in the electromagnetic field in the area of the iceberg, in the form of a torus. The larger the iceberg, the larger the formed torus. After a certain time, an effect similar to the saturation effect occurs, in which a certain "separation" of a given energy vortex from a specific geographic point occurs. An electrical breakdown between clouds (ionosphere, etc.) and the earth's surface or ocean water in the form of lightning (thunderstorms) that occurred at another point on the planet, according to the law of conservation of energy in the electromagnetic circuit "Planet Earth" forms a counter charge (a kind of compensatory electromagnetic vortex) which leads to the emergence of both hurricanes and vortex air tornadoes, called "Tornado". The location of the point of origin of the "compensation vortex" depends on many factors, including astrophysical ones, for example, the solar wind, as well as the gravitational (tidal) and electromagnetic effects of the planet Moon on the planet Earth.

The intensity of the Earth's geo electric field at an altitude of 20 km is about 130 V / m, which leads to super powerful discharges and the discharge of excess energy accumulated in the atmosphere, and the formation of natural phenomena. A debris spot, like a dielectric, prevents the discharge from occurring and leads to a redistribution of energies. A discharge occurs either in the adjacent region with a spot of increased power, or the field strength increases until a breakdown of an additional dielectric (debris spot) occurs. Hence, unprecedented tornadoes, tornadoes, typhoons, which form powerful downdrafts of air, which in turn cause fluctuations in the water on the ocean surface, leading to floods and tsunamis. All the factors considered in the sum make global changes in this relatively balanced process, which has been formed over billions of years. This imbalance is reflected in particular in the climate change that has taken place over the past 50 years.

2. IMPACT OF MAPPED OCEAN WASTE POINTS ON CERTAIN CONTINENTS

Humanity should think and understand that the further accumulation and increase of debris in the oceans can cause an irreversible reaction (similar to a chain reaction) to desynchronize the electromagnetic system of the planet as a whole. Humanity turned out to be unprepared for such large-scale changes affecting all corners of the planet. The current global climate change, due to garbage spots in the oceans, has caused a number of irreversible consequences already on every continent of our planet.

We conducted our own research, overlaying a map of adverse natural factors that have occurred in the world over the past decades, and revealed a clear relationship between the geographical location of garbage spots in various oceans and climate change on the following continents:

Northern Pacific: **Western part** **Eastern part**	 **North America** **Europe**
Indian ocean	**Australia, South-East Asia**
South Pacific	**Central America, South America**
South Atlantic	**South America**
Central Atlantic	**Central America**

The main task of mankind today is to reverse the situation and gradually begin to solve the problem of "garbage in the ocean" until it passes into the stage of an irreversible process.

3. ATTEMPTS OF SOLVING PLASTIC COLLAPSE

30 world leaders like Henkel, P&G, Shell and other companies declared that they would assign combined $ 1 billion for recycling of plastic. The reality, however, is that scientists and ecologists say saving the situation is only possible through reduction of production of plastic in the world. But in reality only in 2019 the world increased production of plastic by times. The UN prognosis looks disillusioning: if nothing is done, then the amount of unrecycled plastic by 2025 will reach 200 million tons

Many nowadays are trying to save the ocean. A good example is "TEO OCEAL CLEANUP", that collects drifting large and small plastic parts with flexible barriers with netting. Plastics and garbage collected this way need to be brought to the shore which causes great logistical losses. Besides that additional recycling plants are required to process this material. And last but not least, a 600-meter U-shaped pipe with an underwater ladle does not collect micro plastic but can harm living organisms.

Other measures, most of which are preventive, include finding alternatives to plastic material. Let's consider those alternatives from the points of view of practice and reality

Shift to bio decomposing polymers.

In fact, those materials are okso polymers or ordinary plastic with additives accelerating its disintegration but not decomposition! In other words, we will receive rapidly composing micro plastic which does not eliminate plastic itself.

Using of 100% organic polymers

Using of 100% organic polymers made of corn starch. However, if such a change to replace plastic by organic polymers happens on a global basis, all garbage collection sites will be overloaded with organics producing methane - a climatically aggressive gas, which by itself is another ecological collapse!

Replacing plastic bags by paper bags

Replacement of plastic bags by paper bags is not considered expedient as well. A complete replacement of plastic bags by paper bags will increase the wood felling by 15% as paper is produced primarily from wood. This will be a new extermination of woods!

Plastic production from recycled plastic

It is possible to collect a plastic bottle from the ocean, recycle it and to produce another plastic bottle from it. However, this will fight the consequences but not the cause of the problem. The main question is how to solve the problem technologically and who will cover the financial losses as plastic recycling is much more expensive than the production of ordinary plastic. And this is an economical problem!

In summary, it should be noted that any replacement of plastic by any alternative, will inevitably harm the nature. The reason is that in any scenario natural resources of our

planet will be used at the price of ecological pollution. The following numbersat first sight are not related to plastic. As per calculations of the Swedish institute of ecological research, manufacturing of one electric drilling machine produces 51 kg of waste, one smartphone 86 kg of waste and every notebook has a tail of 11,200 kg of waste.

And not all of those waste components are recyclable or reusable: most of them are designed in such a manner that it is impossible to separate them from each other. For example, paper, plastic and aluminium in “tetra packs”. Or the quality of material deteriorates rapidly thus reducing the number of pressurized thermos treatment (down cycling phenomenon). In this connection the majority of plastics may be recycled no more than 5 times after which it ends up again at the garbage sites or in the ocean.

Even if in the future those alternatives are considered, it will not stop pollution.

Micro plastic does not know boundaries. It constantly migrates in the Earth’s eco system through water, air and ground. Utilization of micro plastic is the first and foremost task for the humanity to resolve if we don’t want to disappear from the face of the planet. This is why the start of the SUSTAINABLE PLANET Project comes so on time timely and is so actual.

HUMANITY HAS ALREADY CROSSED «THE POINT OF NO RETURN»!

The critical mass of micro plastic accumulated in the oceans and on land will lead to total ecological catastrophe.

4. SUSTAINABLEME IS THE SOCIAL HUMANITARIAN MISSION AS A SOLUTION TO GARBAGE COLLAPSE

Until today, no company in the world has been able to offer a real solution to the problem. Purification of marine waters by catching plastic leads to accumulation of this plastic on land. Replacing plastic with eco-plastic or paper entails other environmental issues. In the meanwhile, plastic production in the world continues to rise, and the situation threatens the existence of life on earth.

During the recent years, ADGEX has focused on innovative solutions to our planet's environmental problems. It is the global mission of all ADGEX activities. And a separate place was given to solving the problem of plastic Islands in the ocean and deep recycling of plastic (in all its types and fractions) directly on sea.

ADGEX is one of the few world leaders who delivers new progressive products, changing the usual stereotypes of customers and creating a new world. ADGEX scientists are committed to sustainable technological solutions to keep our planet clean and healthy for decades to come.

> **The most important achievement of this Project will be the freeing of our Planet from garbage both on land and in the ocean.**

Our Project is aimed at a speedy recovery of the Earth's environment and at assisting the planet to dispose and recycle of any organic and human waste. GreenBLAZE processors are designed to dispose and fully recycle organic waste at land and in the ocean producing clean electric power. Our energyBRICK batteries are capable of delivering this energy to the consumers wherever they may be.

Together we can leave a sustainable Earth for future generations.

ADGEX TECHNOLOGIES ARE DESIGNED TO COMPLETELY PURIFY THE WORLD'S OCEANS FROM PLASTIC:

1. **An ecological platform** for collection of garbage and plastic "dissolved" in the water with the subsequent chain of works for purification and recovery of water.
2. **Mechanical filtration** is the removal of particles up to 100 microns.
3. **Ultrafiltration** is the removal of particles up to 1 micron.
4. **CRIBROL** is the removal of micro particles less than 1 micron.
5. **Photolytic Ozonation** is the removal of dissolved organic materials and the saturation of water with oxygen.
6. **GreenBLAZE technology** for processing any natural carbon-containing materials into electricity and methanol.
7. **EnergyBRICK** for powering all of our equipment in the ocean.

SustainableMe it is an innovative way to attract the attention of the world community to the problem of ecology and ocean pollution.

ADGEX plans to equip the first tanker ship, which will house the entire basic set of ADGEX Technologies for removing and extracting plastic particles dissolved in water and other debris in the ocean. Then all collected garbage and plastic will be recycled into effective commercial product. In particular, electricity or methanol. And achieved profits will be used to build a fleet of similar vessels which will serve as the ocean medics as well as a contribution to charity and to welfare.

The Management of ADGEX appeals to all progressive peoples, namely to everyone who is not indifferent to the problem of ocean waste, to everyone who wants to take part in cleaning up the Planet, whether they are individuals, investors, businessmen, foundations, organizations, or Governments of States - please email: SustainableMe@adgex.com

ADGEX will be happy to join our efforts to achieve the result!