

Glossary: Terms and Definitions

Abbreviation **uST (UST)** stands for the central brand of Unitsky Group of Companies (UGC); it combines the names of Unitsky String Technologies (uST), the parent engineering company Unitsky String Technologies Inc. (UST or UST Inc.), uST transport and infrastructure complexes / Unitsky String Transport as the physical embodiment of uST transport and infrastructure solutions.

Active protection system (APS) is a generator of electrostatic field where negatively charged debris of space garbage create resonant vibrations in it.

Artificial atmosphere is a specially selected mixture of gases, which ensures regular breathing and gas exchange in living organisms, including humans, who are in an enclosed ecosystem; has the same quality as the Earth's atmosphere. The gas component of the EcoCosmoHouse (ECH) space is an artificial atmosphere.

Biofuels are various types of combustible products derived from plant raw materials. Their main advantages are renewability and accumulation of solar energy coming to Earth.

Biological balance is the preservation of dynamic stability of natural complexes (biogeocenoses) over a long period of time, i.e., relative balance of stability of species composition, number and productivity of living organisms.

Biological diversity is the natural diversity of life in every manifestation as well as an indicator of the complexity of the biological system, the diversity of its living components. Biodiversity is considered at the hierarchical levels of life organization with the following main ones: molecular and genetic, organism and species, biogeocenotic and biospheric.

Civilization technogenic fork is a stage of development of the Earth's technosphere, which, when achieved, makes the technogenic human civilization face with a historically important choice of two mutually exclusive scenarios of action:

1) Earth's civilization continues to develop conventional technogenic vector, limited only by the planet's size and resources.

At the same time, resource consumption does not change dramatically because the world economy relies on obsolete and resource-intensive technologies (primarily, century-old transport and logistics technologies). As a consequence, the point of no return from degradation, extinction and death of human civilization will come in about two generations (in the third quarter of the 21st century);

2) the beginning of near space industrialization, gaining access to its unlimited resources, infinite space, matter and energy as well as new technological resources: weightlessness, deep vacuum, technological purity (without dust and microorganisms) and cosmic radiation. Mandatory requirement: inefficient transport and infrastructure technologies, power industry, habitat (cities), infrastructure and agriculture used on the planet, which pose the greatest threat to the Earth's biosphere, must be replaced by better communications and eco-oriented technologies.

EcoCosmoHouse for civilizational panspermia (ECH-Arc) is a cosmic structure with an enclosed biospheric ecosystem designed for interstellar flights. Shaped like a rotating body, a spindle with a length ranging from 500 to 2,000 m and a diameter of 200 to 500 m, it is capable of preserving Earth life, including a crew of 1,000 to 10,000 people, for transportation to exoplanets. The ECH-Arc not only represents a miniature Earth's biosphere but also functions as an incredibly complex, autonomous aircraft capable of sustaining itself for thousands of years. It encompasses its own energy systems, engines, fuel reserves, nonrenewable resources (not involved in the biospheric cycle), engineering communications, repair facilities, residential and industrial spaces, agricultural technology, agro- and aquacultures, flora, fauna and fertile soil. Additionally, it includes a society with a kindergarten, a school, a university, a medical facility and workplaces for a hundred specialties, etc.

EcoCosmoHouse on planet Earth (ECH-Earth) is a structure on Earth designed for autonomous and unrestricted long-term residence of a human settlement with calculated density. The inner enclosed space of the ECH-Earth provides

conditions for the development of ecosystems, has a necessary set of the planet's biosphere properties in this regard and additional technological processes that are modeled to ensure human needs for existence (parameters of the atmosphere and habitat, food resources, etc.). The ECH-Earth is an Earth biospheric model of the ECH in terms of creation and arrangement of internal space and all relevant components (biosphere, technologies, process interconnections, etc.) with an enclosed cycle of matter (living and mineral), energy and information.

EcoCosmoHouse technological platform (ECH) is the construction of buildings in space with an internal inhabited space, isolated from the external aggressive space environment. There is an enclosed ecosystem of the Earth's type in the ECH, including artificially produced gravity, living fertile soil, flora and fauna (comprising microflora and microfauna), atmosphere with adjustable parameters (temperature, humidity, etc.) for unlimited long-term, autonomous, eco-comfortable living and activity of both individuals and groups of them and many thousands of settlements in equatorial orbits of the planet as well as in open near space and deep space.

EcoHouse technological platform is an eco-oriented construction of residential and industrial buildings and structures on Earth with adjacent space open to the external natural (biospheric) environment, filled with natural and cultural (organic farming) ecosystems, in which atmospheric, soil and water parameters are regulated by the Earth's nature. The soil from under the buildings during their construction is transferred to the roofs and floors to be then enriched with living humus. Greening is based on the principle that all construction on the planet is meant to increase the area of fertile soil and its fertility.

EcoSpace is the program to provide for the development of eco-oriented biospheric technologies in order to transform the main sectors of the Earth's industry, infrastructure, power industry, transport and agriculture. It assumes bringing the hazardous part of the Earth's industry out into near space to secure the balance in a perfect world represented by BioSpace, TechnoSpace and HomoSpace triunity, which together form a complex of optimal conditions for sustainable growth and further development of the Earth's technogenic civilization in cosmic direction.

BioSpace is a restored and balanced planetary biospheric ecosystem open to space, which no longer experiences the devastating human-made effects

of the Earth's technosphere and continues to evolve by the laws of evolutionarily established terrestrial nature. It comprises:

- natural and cultural (organic farming) ecosystems on the planet land, including aquatic ones (lakes, rivers, etc.);
- oceanic, marine and atmospheric ecosystems with the possibility of eco-friendly external control of weather, climate and other systems of the planet through natural methods;
- flora and fauna of terrestrial and aquatic ecosystems (including microflora and microfauna) with their biodiversity preserved and currently available;
- Earth's humanity with each individual being healthy and happy.

TechnoSpace comprises newly created industrial components:

- 1) Earth's industry which is based on novel eco-oriented technologies and consisting only of the technological industries necessary for humans within the Earth's biosphere;
- 2) space industry, including energy-consuming, resource-intensive, hazardous and other industries that are moved outside the Earth's biosphere, which acquire an absolute competitive price and quality advantage as part of the space technological environment;
- 3) the GPV geocosmic transport complex, providing environmentally friendly transport and logistics link between the Earth's and space components of the industrial TechnoSpace with cargo, energy, information and passenger flows of industrial scale;
- 4) artificial intelligence to manage the above components 1-3 under the multilevel control of HomoSpace.

HomoSpace is an advanced world sociopolitical system based on the consolidation of the international community of biological humans (but not digitized bio-robots-convergents) around a single governing center accumulating the territorial, financial, economic, scientific, human, military and political potential of all participating countries. This will open the gate to inexhaustible and accessible resources of space and through space-oriented economy of the technogenic civilization on Earth will create new sociopolitical and economic conditions for the most complete implementation of sustainable development of biological humanity,

including social justice, equality, freedoms, harmonious development as well as the right of every inhabitant of the planet for a worthy long and happy life. HomoSpace is developed and governed by people using artificial intelligence as an assistant and advisor (but not a leader). The main value of HomoSpace is the humane attitude of Human and his spirituality as a sociobiological quintessence created by the Universe (God) as a result of billions of years of life evolution in the space home named Planet Earth.

Ecosystem is a biological system (biogeocenosis) consisting of a community of living organisms (biocenosis), their habitat (biotope) as well as a system of connections that exchange substance and energy between them.

EcoTechnoPark is a demonstration and certification center for uST transport and infrastructure solutions, built in the Republic of Belarus (Maryina Gorka).

Equatorial Linear City (ELC) is the Earth's component of geocosmic transport and communication complex which locates the GPV takeoff and landing overpass (uWay) with the whole infrastructure required for the GPV to fly and for servicing global geocosmic cargo and passenger flows. This city represents a harmonious blend of cluster settlements with the natural environment of land and ocean areas of the planet. The settlements are interconnected by uST tracks and stretch along the equator.

Food solar bioenergy (FSBE) is power industry based on the integrated consumption and processing of biomass of greenery that has absorbed the energy of the Sun to produce biofuels, animal feed and food for humans.

General Planetary Vehicle (GPV) is a geocosmic self-supporting reusable torus-shaped spacecraft for non-rocket near space industrialization encircling Earth in the equatorial plane; it ensures industrial cargo and passenger flows (millions of tons of cargo and millions of passengers per year) from Earth to near-Earth equatorial orbits and back; it is based on the only possible (from the point of view of physics) environmentally safe and energy-efficient geocosmic transportation technology which uses only internal force of the system (spacecraft) and electric energy.

GPV takeoff and landing overpass (uWay) is a take-off and landing, energy and communication overpass complex for geocosmic transportation, located along the equator and combined with a linear eco-settlement of new generation.

Industrial Space Necklace "Orbit" (ISN "Orbit") is a multi-orbital transport, infrastructure and industrial-residential complex serving the Earth's humanity and covering the planet in the equator plane. It is a functional analogue of the Earth's ELC, however, located in space, as well as a range intended to protect from space threats (including meteorites) and a platform for the expansion of the Earth's civilization into deep space.

Linear city (uCity) is a cluster-type pedestrian urban settlement with its ground surface intended for people, animals and greenery; the development of residential, administrative, industrial and multifunctional clusters is implemented through the eco-oriented EcoHouse technologies; electricity and heat are obtained by the uEnergy technology; food supply is linked to the uGreen technology of organic farming; transport, energy and information communications are arranged above ground on the second level (elevated version) according to the uST technology. Linear cities are characterized by the absence of devastating human-made effects on the biosphere, high efficiency of urban economy and its autonomy as well as decent quality of life and working conditions for each resident.

Relict solar bioenergy (RSBE) is power industry based on the use of fossil brown coal and oil shale to produce clean energy and form living humus, which is necessary to restore the fertility of various types of soils.

Space-based solar power plant (SBSPP) is an orbital solar power plant using solar energy; it provides energy independence and biospheric environmental safety of the ISN "Orbit."

Space industrialization vector is a global re-equipment of the Earth's technosphere to eliminate its devastating human-made effects on the Earth's biosphere by transferring hazardous, energy- and resource-intensive industries into near space on low-Earth orbits. The space industrialization vector is also about using eco-oriented technologies to modernize that part of industry still on Earth and functioning in the biosphere.

Sustainable development is "the development that meets the needs of the present without compromising the ability of future generations to meet their own needs." This concept was formulated by the UN World Commission on Environment and Development and is the basis of the UN goals and principles.

Sustainable Biosphere Cluster (SBC) is a competence center for desert greening. The SBC will be the basis for the implementation of the uGreen technology platform under the conditions of a hot tropical climate – an environment with negative impact factors (e.g., high temperature) affecting plant cultivation.

Sustainable-BioTech is an ecological system combining a set of innovative engineering, agro-, bio- and soil-forming technologies. Its main components are relict and organic raw materials as well as soil untouched by plowing and soil microorganisms, taken in a special way from the world Bank of fertile soils, located on the territory of Unitsky's Farm Enterprise (Maryina Gorka, Belarus). Raw materials are finally processed into a living fertile humus with the help of associations of soil microorganisms and a unique species of *Lumbricus* uTerris worms, specially bred in Unitsky's Farm Enterprise.

uBioSystem is an enclosed ecosystem with controlled technological processes (lighting, temperature schedule, air-blasting, water flow rate, etc.) for autonomous and long-term existence of a community of living organisms.

uEnergy technological platform is designed to generate green electric and thermal energy using:

- specially equipped thermal power plants for eco-friendly combustion of brown coal, shale, peat and other raw materials of organic origin in order to produce living fertile humus from their combustion waste;
- renewable energy sources, namely the solar energy on Earth and in space as well as the energy of wind and sea currents;
- hydrogen-oxygen pair as a fuel accumulator for the optimization of the planet power industry and space transportation.

uGreen technological platform is organic farming in a new logic of recreation and intensification of natural biospheric processes by direct borrowing and using natural soil ecosystems with their microflora, microfauna and biogenesis as well as in the logic of a complete rejection of any synthetic chemicals (fertilizers, plant protection agents, etc.), technologies of genetic modification and other elements of traditional intensive farming.

uMach is the concept of a hypervelocity uST transport and infrastructure complex. It is designed to travel at speeds over 1,000 km/h inside a forevacuum tunnel (with artificially reduced atmospheric pressure) to provide high-speed transportation for long (from 200 km) distances.

uNet transport and infrastructure network is an international transport, energy and information communication network created on the basis of uST transport and infrastructure solutions along uCities.

uSky Test and Certification Center is a research and production cluster of uST transport and infrastructure solutions, built in the United Arab Emirates (Sharjah).

uSocio is a new type of optimal social environment for small groups of individuals (2,000–5,000 people) which is based on stratification. In uSocio, due to the possibility of free choice of accommodation, the following social needs will be fulfilled: sociocultural ties, common values, religious outlooks, respect of traditions, passion for the arts, development of ethnic and interethnic contacts, etc.

uSpace geocosmic program is a program of non-rocket near space exploration by means of the GPV, which will preserve the Earth's biosphere by taking the industry (technosphere) outside of planet Earth (beyond the biosphere).

uST technological platform is the construction (along uCities) of a new kind of transport, infrastructure, energy and communication networks uNet, created on the basis of prestressed (string) Unitsky's structures. It is designed to provide all necessary communication links between objects (and continents) on Earth; between objects in near space moving on circular equatorial orbits; between objects on Earth and those deployed in near space.

uTerra is a biohumus (crumbly and liquid – fertility elixir) produced using brown coal, ash, organic raw materials, inoculum, aerobic and anaerobic microorganisms to increase fertility and improve the quality of any soils, including desert sands.