

## Glossary: Terms and Definitions

Abbreviation **uST** stands for the central brand of Unitsky Group of Companies (UGC); it combines the names of Unitsky String Technologies, the parent engineering company Unitsky String Technologies Inc., uST transport and infrastructure complex / 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 the 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 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 21<sup>st</sup> 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 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 has 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 of program, which together form a complex of optimal conditions for sustainable growth and further development of the anthropogenic Earth's civilization in cosmic direction.

**BioSpace** is a restored and balanced planetary biospheric ecosystem open to space, which no longer experiences the devastating man-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) GPV geocosmic transportation 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 socio-political system based on the consolidation of the international community of biological humans (but not digitized convergent biorobots) 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 socio-political 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 Man and his spirituality as a socio-biological quintessence created by the Universe (God) as a result of billions of years of evolution of life 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 Gor'ka).

**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 reusable torus-shaped spacecraft for non-rocket near space industrialization encircling the Earth in the equatorial plane; it ensures industrial cargo and passenger flows (millions of tons of cargo and millions of passengers per year) from the Earth to near-Earth equatorial orbits and back; 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 (aircraft) and electric energy.

**GPV takeoff and landing overpass (uWay)** is a takeoff and landing, energy and communication overpass hub 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 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 supplied 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 man-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 man-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.

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

**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 the planet Earth (outside 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 produced from brown coal, ash, organic raw materials, inoculum and aerobic microorganisms to increase fertility and improve the quality of any soils, including desert sands.