Factories in Space is the largest public database of commercial entities in the in-space economy, space resources and microgravity manufacturing. Directory started in 2018 and has over 700 entries.

Enabling ecosystem for space resources would include most of the in-space economy startups, from technologies to customers. Enabling infrastructure ecosystem is narrower but still very broad.

Cambridge Dictionary defines infrastructure as "the basic system and services, such as transport and power supplies, that a country or organization uses in order to work effectively".

Compared to the 10 categories for in-space economy at Factories in Space, leaving out Human Spaceflight, Space Stations, In-Space Manufacturing (ISRU is still included) and Miscellaneous. While they can be helpful, they are not strictly an enabling infrastructure.

Re-Entry Capsules Cargo Transportation



· Re-Entry Capsules (Earth, Mars) Launchers, landers and re-entry vehicles are enabling infrastructure. A-SPAX A STROBOTIC AS TROBOTIC CERES TODOTICS COSMOX DRAPER ELENTION VIEW STREETICE CE CHINA China Academy of Space Technology

SpaceWorks 5 PACEZ

-actories in Space

In-Space Internet Space Utilities

Reusable Launch

Commercial Landers Cargo Transportation

Space Traffic Management

KLAUS T PTSCIENTISTS SYTTHOM A RAVED SPACE SYSTEMS > RAVED Reaction RETSS REENTER RESS

SIERRA SPACE CARGO UNLIMITED SPACE CARGO UNL The Exploration Company

Propellant Reloading In-Space Transportation

> Water Space Utilities



Enabling Infrastructure Ecosystem for Space Resources

Erik Kulu, erik.kulu@factoriesinspace.com Space Resources Week 2023, April 19-21

Surface Habitats

Hoppers, Drones

Surface Spacecraft

Landing Pads In-Space Manufacturing

Commercial Rovers Surface Spacecraft

Mass Driver, Kinetic Launch Cargo Transportation

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Space Utilities

Energy

In-Situ Resource Utilization Space Resources, ISM

Space Resources ISRU (In-Situ Resource Utilization) · Pure Substances (Ice, Oxygen, Metals) · Space Mining, Lunar Mining, Asteroid Mining · Prospecting, Processing, Beneficiation, Recycling Space resources is a category for directly space mining related activities. Astronika ASTRUM A ARBUS AMI ETHORSE DE DELLO CAR EXPONENTIAL DEEP SPACE Hanwha Systems Willing HELIDS HONDA The Power of Dreams The Power of Dreams 3 MINE-SPACE Moonrise Mining Inc. NEVEN L VENNE N-ORA EUS Orbit Recycling が起源太空 PRE OSHKOSH (KOSH) PLANETARY RESOURCES PLANETOID MINES COMPANY AND THE SISTERS SEVEN SKYHAVEN Takasago Thermal Engineering Co.,Ltd. 🕅 LIQUID TERRAXIS THALES **Space Utilities** · Energy, Power-Beaming In-Space Internet, Data Relay · Navigation, Water, Propellant Utilities are required for transportation, mining and processing. AGPower 92 AIRBUS ALVIOR APHELIA AQUARIANSPACE A GROUP AND ASTROBOTIC EXAMPLE AVALANCE IN TECHNOLOGIES, INC. HEDY-ANTHIEL ANT HelicitySpace HONEYWEI A HONE HOUSTRIES HONE GIANT GO INDICIUM.Space ECL Japan Space Systems $\mathbb{E} \in \mathbb{P} \subseteq \mathbb{R} \in \mathbb{R}$ Leocloud $\mathbb{E} = \mathbb{E} \in \mathbb{R} \in \mathbb{R}$ Lock $\mathbb{E} \mathbb{R}$ Lock $\mathbb{E} \in \mathbb{R}$ Lock $\mathbb{E} \in \mathbb{R}$ Lock $\mathbb{E} \mathbb{R}$ Lock \mathbb{R} L OVERVIEW ENERGY COPULAR POWERLIGHT OF LES PRINCETONSATELLITE OPULAR Reach SPACE SPACE SOLAR 5 SOURCE ENERGY COMPANY SKYTECH ELAR SPACE TECHNOLOGIES Solar Space Dowering the Future of Space SPACENUKES

SPACEX Surface Facilities

Surface habitats and structures are required for storage and processing. STROPORT Space COOGY H IC DOVER COSpace Design INSTARZ OF LavaHive *preumocell* O Tellar Relativity SEArch+ Search+ TEAGUE THE LUNAR RESOURCES COMPANY UNITED SPACE STRUCTURES

Asteroid Mining Space Resources

Space Tugs (Reusable) In-Space Transportation

> **Prospecting, Inspection** In-Space Transportation

Active Debris Removal In-Space Transportation

THALES The Lunar Grid **O**SPATIAM TRACTEBEL USNC-12 USNUCLEARCORP ISOLS Westinghouse the energy I will ZENO