

# Future Scenarios: Space Diplomacy and International Relations



# Future Foresight in the UAE



UNITED ARAB EMIRATES  
MINISTRY OF CABINET AFFAIRS & THE FUTURE

## UAE FUTURE STRATEGY



Masdar  
A MUBADALA COMPANY

الإمارات تبتكر  
UAE INNOVATES

استضافة حكومات المستقبل  
SHAPING FUTURE GOVERNMENTS

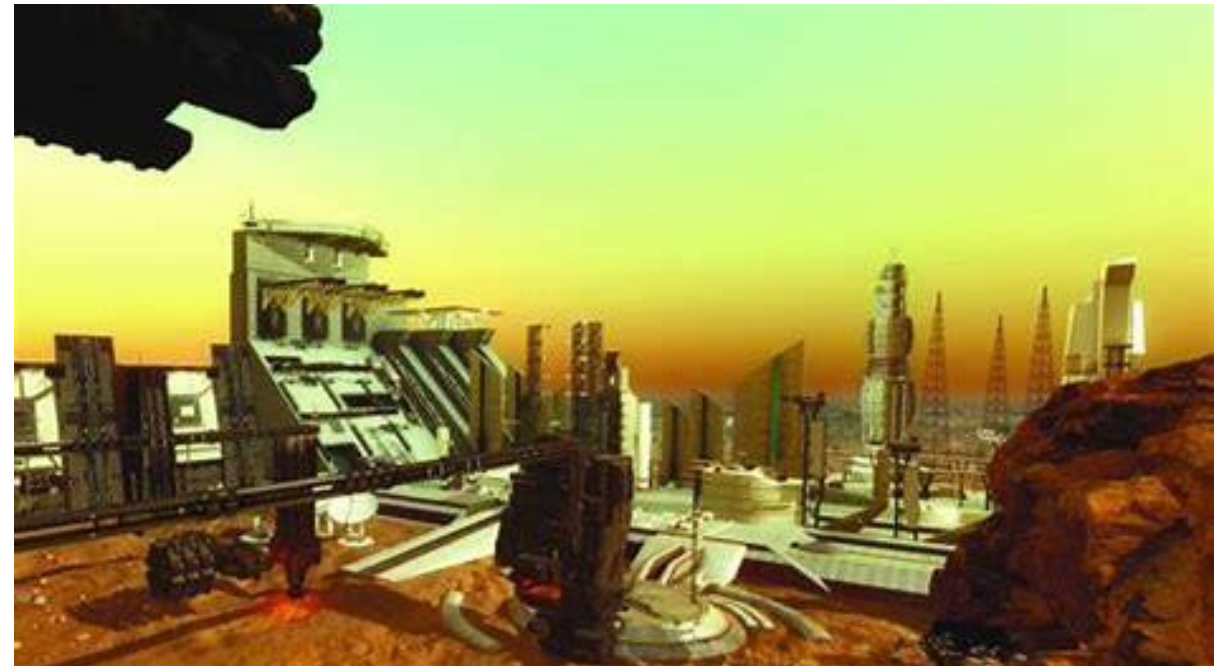
مؤسسة دبي للمستقبل  
Dubai Future Foundation

مسابقة محمد بن زايد العالمية للروبوتات  
Mohamed Bin Zayed International Robotics Challenge  
مواجهة مستقبل الروبوتات

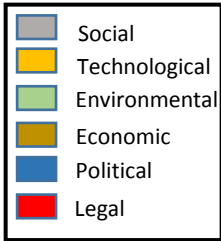
جائزة الإمارات للتطبيقات  
بدرون طائرة للخدمة الإنسانية  
THE UAE DRONES  
FOR GOOD AWARD

WORLD FUTURE  
ENERGY SUMMIT

ABU DHABI  
SUSTAINABILITY WEEK



# Mapping the strategic environment



## Technological Factors

- Technological development
- Cube Satellite
- Satellite Constellations
- Space Traffic Management
- Space Tourism & travel
- Space R&D Progress
- Export/import arrangements
- UAE as ICT Hub
- Biotechnology

## Environmental Factors

- Growing Nuclear Energy dependencies and capabilities
- Environment Protection
- Restrictions on using Hydrazine
- Outer Space debris
- Agriculture investments

## Economic Factors

- Shift in global Economic power
- Space Investment
- Space Economy
- Shift in global Economic power
- Scarcity of Earth natural resources
- Un-employment
- Overseas Economies

## Political Factors

- United Nations
- International Collaborations: Space bilateral and multi-lateral agreements
- Trading policies and Export Import Control policies (ITAR)
- Increased MENA Access to outer space
- 4IR Arab Network

## Social Factors

- Overseas Economies to the UAE and Dubai
- Consumer behaviors and demand (buying trends)
- Rapid urbanization
- National pride to reach space

## Actor Landscape

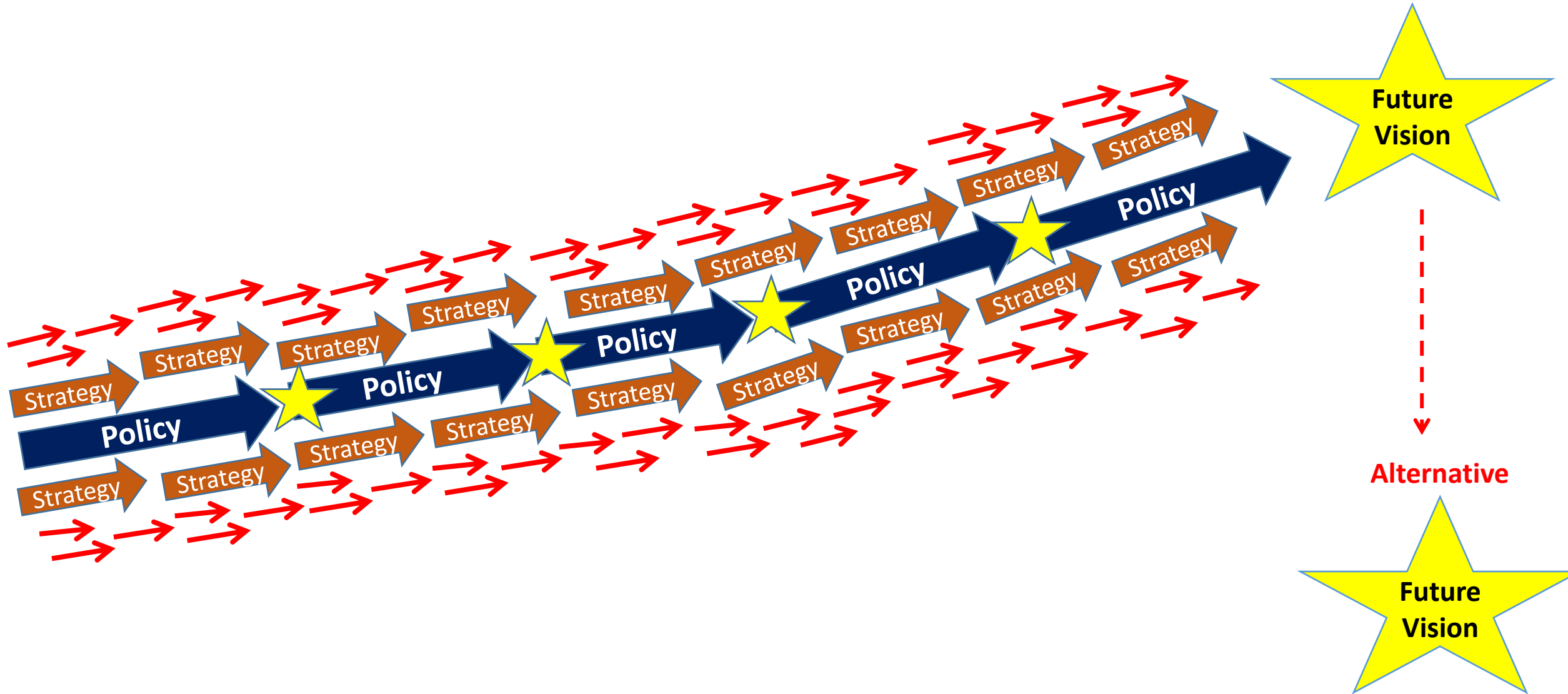


## Client

وكالة الإمارات للفضاء  
UAE SPACE AGENCY

Transactional Environment (Actors)

# Why Future Foresight?



# The Trend analysis

Impact Over 1-5 yrs	Impact Over 6-10 yrs	Impact Over 10+ yrs
<ul style="list-style-type: none"> <li>• Commercialization of the space sector</li> <li>• Enhanced Space Traffic Management</li> <li>• CubeSat</li> <li>• Constellation Satellites</li> <li>• Human Space Flight</li> <li>• Re-useable Launcher</li> <li>• Space Tourism</li> <li>• Long Term Sustainability of outer space</li> <li>• Radio Frequency and Orbital slots.</li> <li>• Space Investment (R&amp;D).</li> <li>• Space debris risks</li> <li>• Space Explorations</li> <li>• 3D Printing</li> <li>• Artificial Intelligence</li> <li>• Space Force</li> </ul>	<ul style="list-style-type: none"> <li>• Information sharing of Space Traffic Management</li> <li>• Space Transportations</li> <li>• Manufacturing of space debris</li> <li>• National Space Stations</li> <li>• Politically binding Long Term Sustainability Guidelines (Politically binding)</li> <li>• Enforcement of Green Propellant and restriction on hydrazine fuel.</li> <li>• Safe nuclear energy</li> <li>• Laser communication for deep space and inter-satellites.</li> <li>• Lunar Gateway</li> <li>• Space Militarization.</li> <li>• Refillable Weaponized satellites</li> </ul>	<ul style="list-style-type: none"> <li>• Space Traffic Management technology for all nations.</li> <li>• Active Space resource utilizations.</li> <li>• Mars Colonisation/Inhabitant.</li> <li>• Long life satellites (30 years).</li> <li>• Unavailability of radio frequency or GEO orbital slots.</li> <li>• Reduction of number of satellite launches due to long life satellites.</li> <li>• Renting satellites as a service.</li> <li>• In-orbit services.</li> <li>• Standards: New Legally Binding treaties.</li> <li>• Radio Frequency and Orbit</li> <li>• Space Solar Power</li> <li>• Richer Society (high demand of private datalinks and live streaming).</li> <li>• Economy of scale of space technology.</li> <li>• Personalised satellites (individual will own/rent a personal satellite).</li> <li>• Active Space Force.</li> </ul>

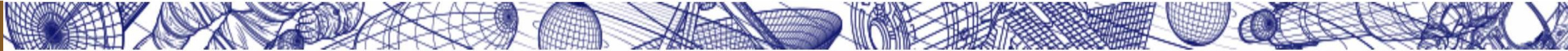
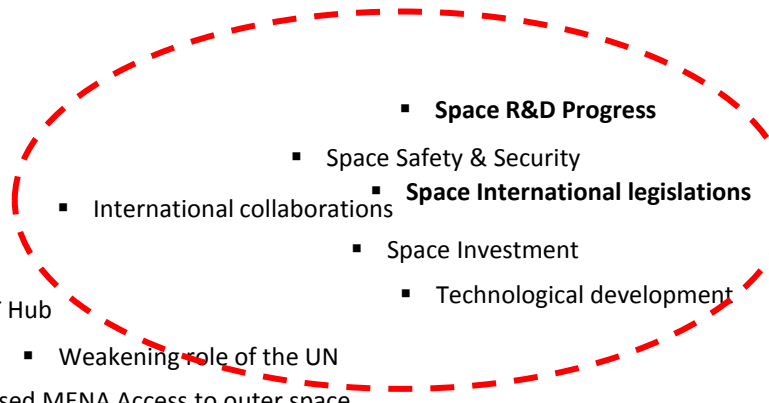


# Organizing the Uncertainties

High  
 ↓  
 Uncertainty Outcome; Ignorance  
 ↓  
 Low

- Space Tourism & travel
- UN SDG2030
- Overseas Economies
- Un-employment
- Scarcity of Earth natural resources
- Employment law
- Environment Protection
- UAE Commercial company law
- IP Laws
- Agriculture investments
- Environment restrictions on Hydrazine fuel
- Growing Nuclear Energy dependencies and capabilities
- International and National Nuclear laws
- International collaborations
- UAE as ICT Hub
- Weakening role of the UN
- Increased MENA Access to outer space
- 4IR Arab Network
- UN LTS Guidelines
- Space Economy
- Satellite Constellations
- Trading policies and Export Import Control policies (ITAR)
- Space Traffic Management
- Space faring nations laws
- Cube Satellite
- Outer Space debris
- Shift in global Economic power
- Space R&D Progress
- Space Safety & Security
- Space International legislations
- Space Investment
- Technological development

Impact on Transactional Environment



# Opposite outcome of uncertainties

Outcome State A

- - - -

## Voluntary

Binding international legislations up to the level of standards which will ensure space sustainability. This will lead to a harmonized national space regulations that will enable interoperability and space accessibility.

Outcome State A

- - - -

## Slow pace

Space research centers will progress in a very fast pace embracing all technology development and disruptives. Noticeable progress on the Spin-off and Spin-on technologies which will enhance human life.

Outcome State B

+ + + +

## Binding

Due to the lack of consensus, international space legislations are in the level of non-binding principles and voluntary guidelines only. Therefore, space access will be limited and dependent on space faring nations national regulations and more bi-lateral/multi-lateral agreements will be seen.

Outcome State B

+ + + +

## Fast pace

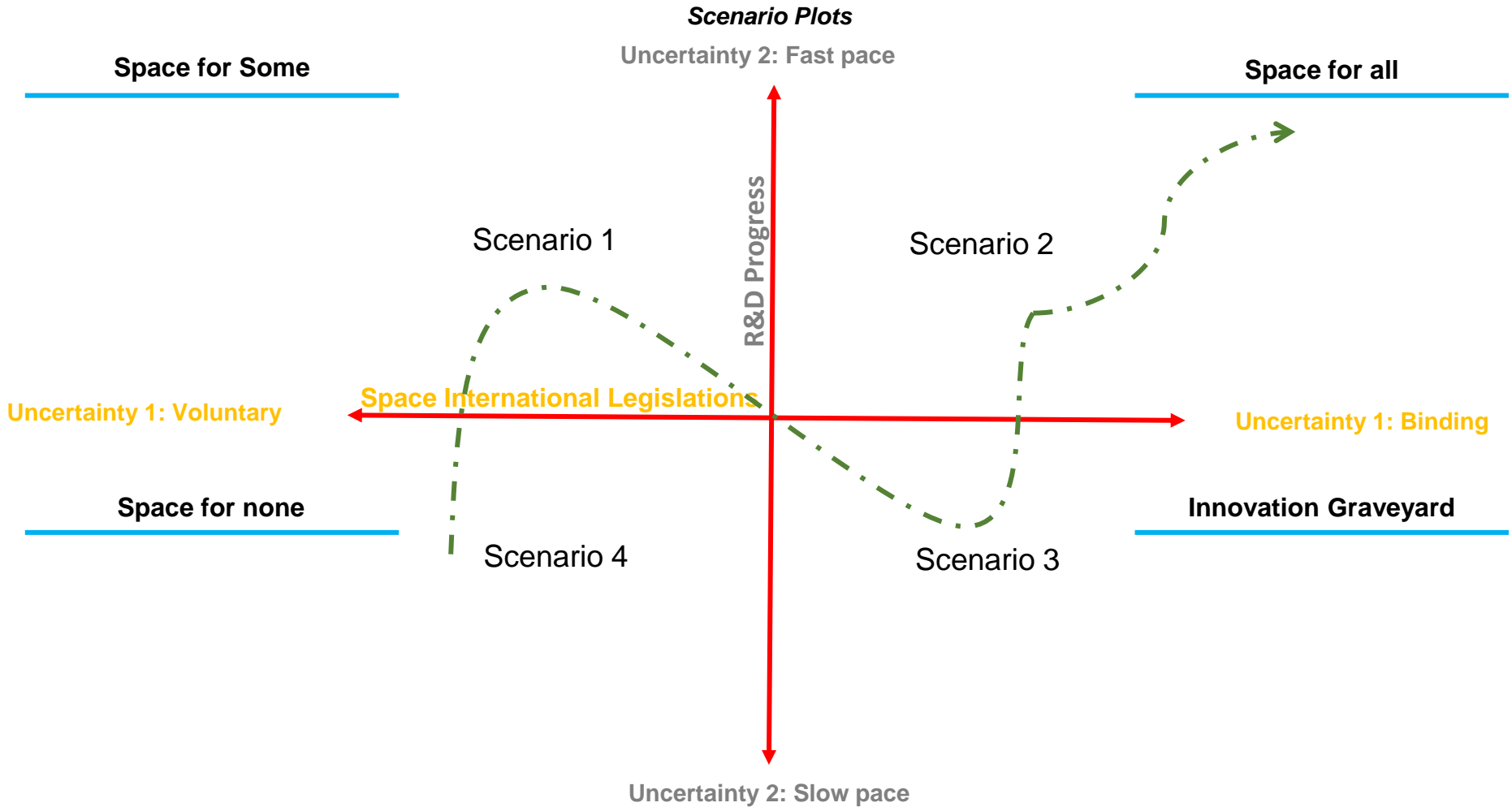
Slow and limited R&D progress, which will slow the process of space explorations and space spin-off/ spin-on technologies.

**Uncertainty1:**  
**Space International Legislations**

**Uncertainty 2:**  
**R&D Progress**



# Scenario framework and plots

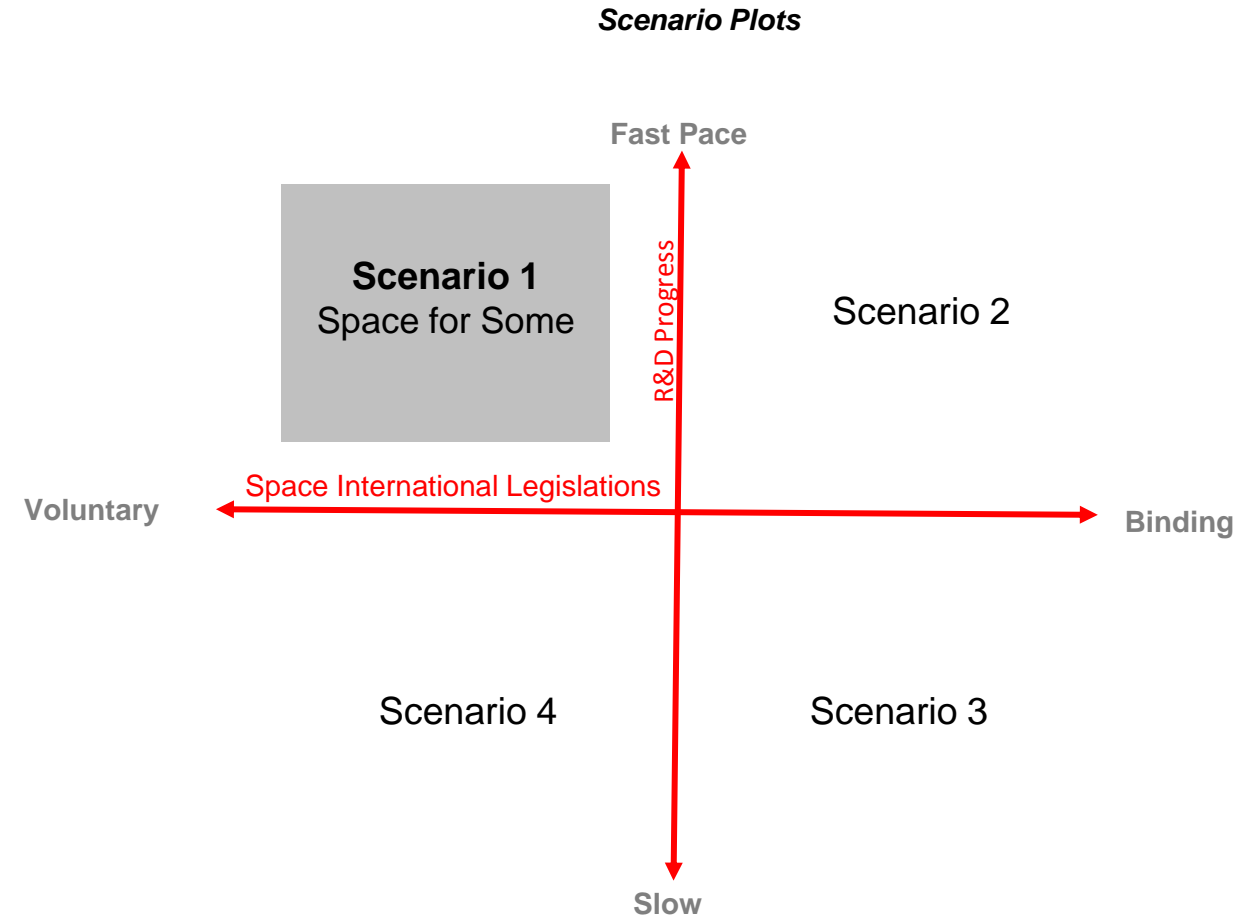




# Scenario 1: Space for some

## Space for Some

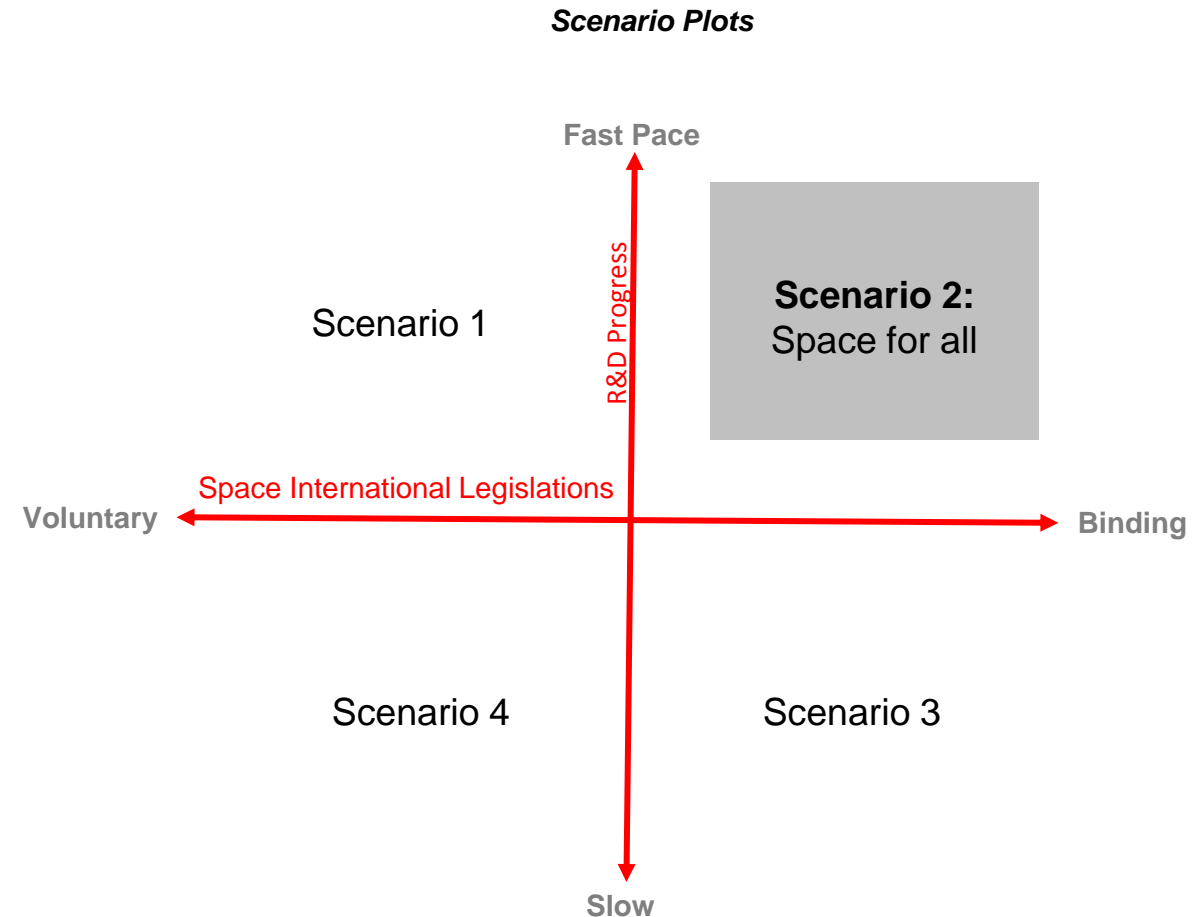
- Voluntarily outdated space international legislations and heavily dependent on the best practices of nations with global market power.
- International cooperation is necessary in this scenario through bi-lateral and multilateral agreements.
- There could be a challenge in achieving interoperability between these different best practices.
- Conflicts may occur on several matters such as: Space resource utilizations and space related accidents which may arise due to the increasing number of debris. The space environment will be congested and sustainability level may decrease.



# Scenario2: Space for all

## **Space for all:**

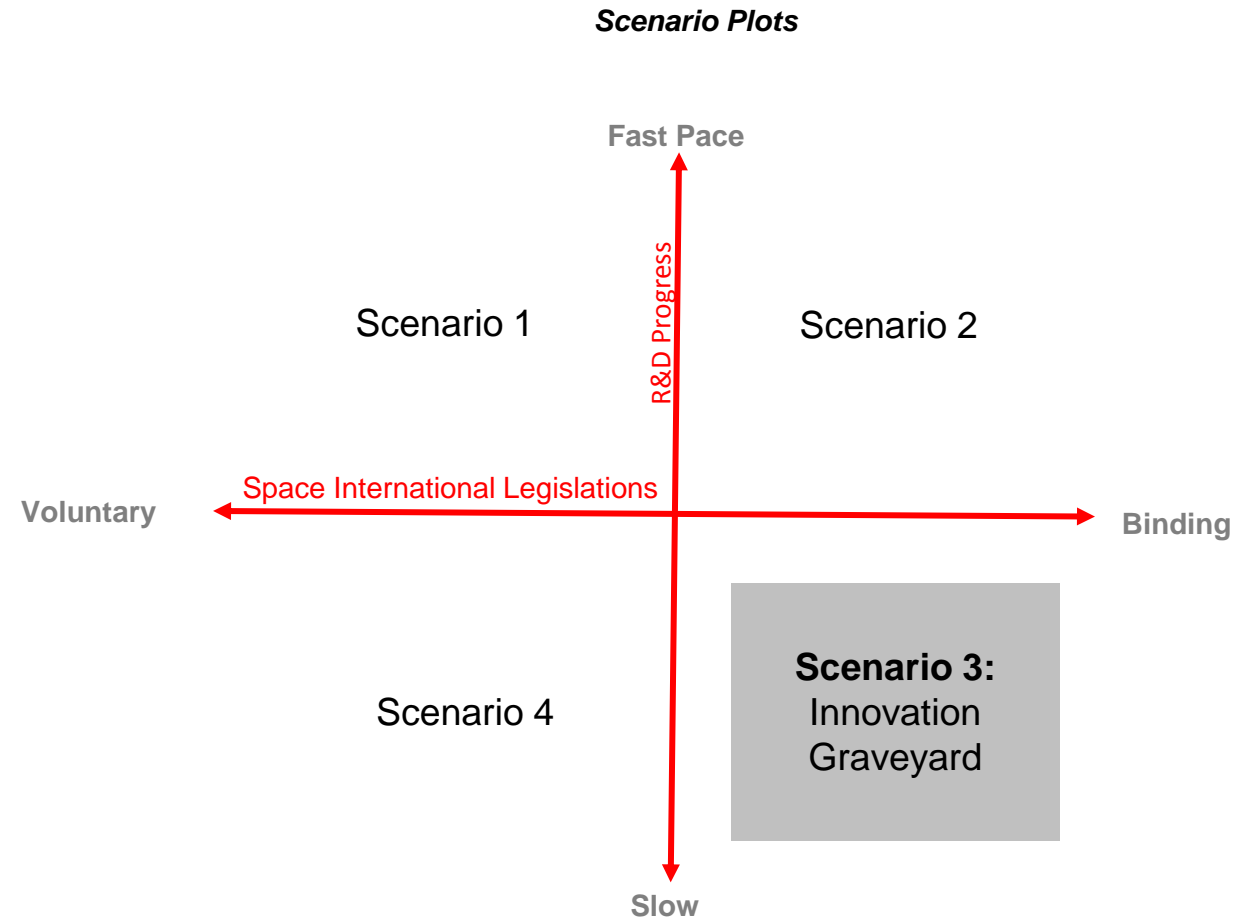
- Technology, manufacturing and safety standards exist at the international, regional and national levels due to the binding effect and consensus reached in space international laws.
- Industries and R&D will be directed by these standards towards an interoperable space technologies. Therefore, interoperability will enable instant joint space missions between nations and by skipping the phase of customized manufacturing.
- International standards will eliminate export/import controls and will enable space technology disseminations and economy of scale space productions.
- Consequently, competition will occur across all stages of the space value chain. As an effect, quality of services will increase and competition will appear on the service level and bring prices down.



# Scenario3: Innovation graveyard

## ***Innovation graveyard:***

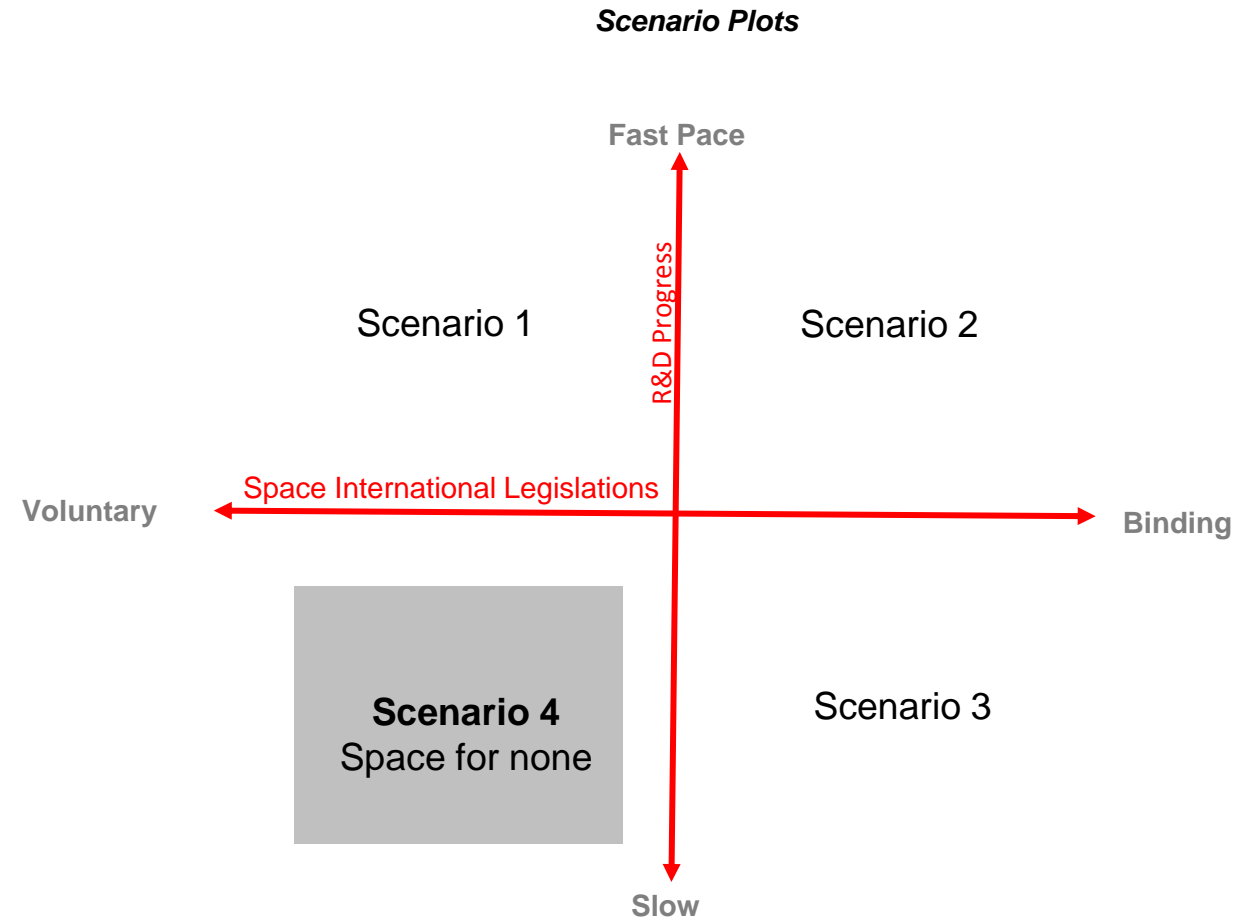
- International law are binding and reached consensus at an earlier stage of the R&D projects.
- Standards may limit R&D innovation specifically after achieving an economy of scale and mass production.



# Scenario 4: Space for none

## ***Space for none:***

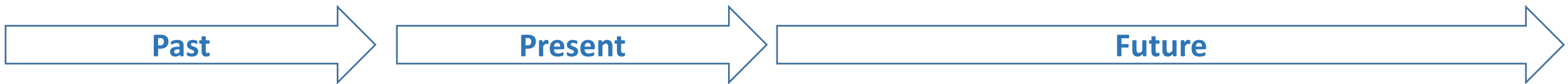
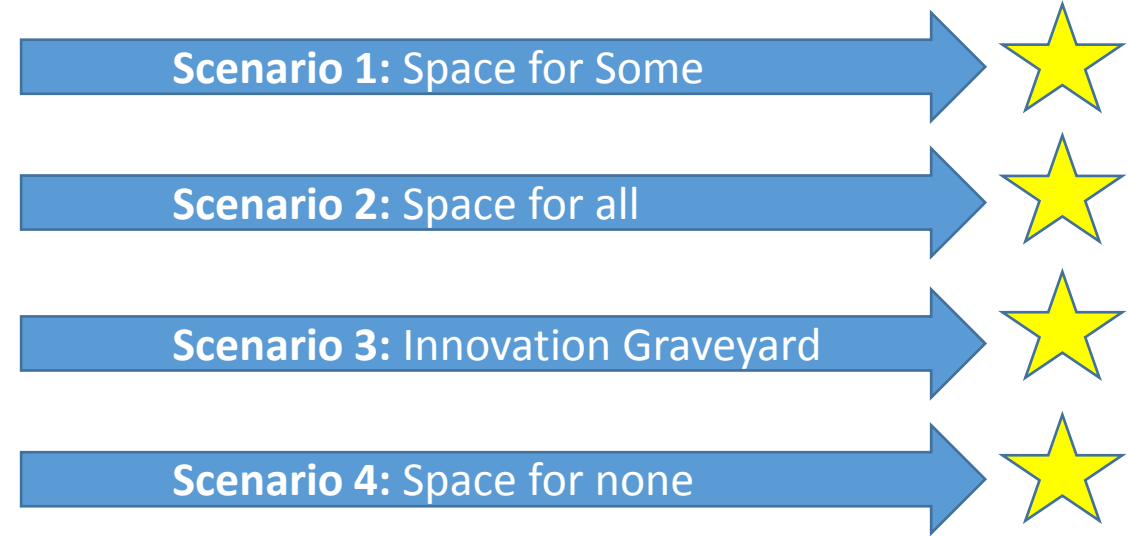
- There exist voluntarily international legislations. The R&D is on a slow pace progress.
- The space access is very limited and humanity is having a very limited benefit of outer space.



# Future Foresight



UNISPACE  
+50



# Recommendations

1. Memberstates are encouraged to evaluate international and national space policies and strategies against all possible Future scenarios of outer space after UNISPACE +50.
2. International community are encouraged to focus on achieving scenarios that will guarantee access to space for all nations.
3. Recognize the need of new international regulations and frameworks to cope with the new R&D and technology developments.
4. Recognize the importance of international cooperation specifically in R&D joint projects, which will encourage cooperation in using space technology and applications.
5. To develop a common trend map with the contribution of Memberstates, to be used as a basis for identifying future uncertainties and future scenarios.

