



## REPORT ITU - ITTLLDC Seminar – 2024

# Satellite Services, National Regulatory Frameworks and Partnerships

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Ulaanbaatar, Mongolia





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### **Abbreviation List**

| APT     | Asia-Pacific Telecommunity  |
|---------|---|
| BICMA   | Bhutan InfoComm and Media Authority                               |
| BTRC    | Bangladesh Telecommunication Regulatory Commission                |
| COP     | Child Online Protection   |
| CRC     | Communications Regulatory Commission of Mongolia for              |
| DITRDCA | Department of Infrastructure, Transport, Regional Development,    |
|         | Communications and the Arts of the Government of Australia        |
| DTH     | Direct-to-Home  |
| EESS    | Earth Exploration Satellite System                                |
| GMDSS   | Global Maritime Distress and Safety System                        |
| GSOA    | Global Satellite Operators Association                            |
| FAA     | Federal Aviation Administration                                   |
| FCC     | Federal Communications Commission                                 |
| GDP     | Gross Domestic Product  |
| GSO     | Geostationary Orbit   |
| HAPS    | High Altitude Platform System                                     |
| HIBS    | High-Altitude IMT Base Stations                                   |
| HTS     | High-Throughput Satellites  |
| ICT     | Information and Communications Technologies                       |
| loT     | Internet of Things  |
| ITT for | International Think Tank for LLDCs                                |
| LLDCs   |   |
| ITU     | International Telecommunications Union                            |
| LDCs    | Least Developed Countries   |
| LEO     | Low-Earth Orbit   |
| LLDC    | Landlocked Developing Countries                                   |
| MCMC    | Malaysian Communications and Multimedia Commission                |
| MDDIC   | Ministry of Digital Development, Innovation and Communications of |
|         | Mongolia  |
| NGSO    | Non-Geostationary Orbit   |
| NOAA    | National Oceanic and Atmospheric Administration                   |
| NTIA    | National Telecommunications and Information Administration        |
| NTN     | Non-Terrestrial networks  |
| P2C     | Partner2Connect Digital Coalition                                 |
| SAR     | Synthetic Aperture Radar  |
| SARSAT  | Search and Rescue Satellite Aided Tracking                        |
| SIDS    | Small Island Developing State                                     |
| SRS     | Space Research Service  |
| STEM    | Science, Technology, Engineering and Mathematics                  |
|         | Telemetry, Tracking, and Control                                  |
| UN      | United Nations  |
| UNESCO  | United Nations Educational, Scientific and Cultural Organization  |
| VSAI    | very Small Aperture Terminal                                      |
| WRC     | World Radiocommunication Conference                               |





### Introduction and opening remarks

# **I1.** Opening statement by Mr. Tapan Mishra, United Nations Resident Coordinator in Mongolia

Mr. Tapan Mishra welcomed the participants of the seminar in the UN house in Ulaanbaatar and introduced the representatives of the Telecommunications Administration of Mongolia -Mr. Tsagaankhuu Sodovjamts from the Ministry of Digital Development, Innovation and Communications (MDDIC) and Mr. Amgalan Zandraa from the Communications Regulatory Commission – who had actively contributed in organizing the event. Mr. Mishra informed the meeting that one of the current priorities of MDDIC was to launch the Mongolian national satellite system as it would enable national digital transformation with the highest efficiency achievable. Satellite systems are providing the countries with the huge landmass with the effective opportunities to ensure connectivity in the remote and low populated areas. In this context the seminar is of the utmost importance for these countries. It also consolidates delegates from different sectors in sharing their knowledge, competencies, country cases in order to explore solutions and forge partnerships, addressing challenges and unlocking their full potential for a more equitable and prosperous future.

Mr. Tapan Mishra expressed his deep gratitude to ITU for supporting the efforts of the developing countries and especially from Landlocked Developing Countries (LLDC) to introduce the up-to-date telecommunications digital platforms. He also highlighted that the outcomes and follow-ups from the seminar could create the background for contributing to the third UN Conference on Landlocked Developing Countries Gaborone, Botswana (10-13 December 2024).

# I2. Introductory remarks by Mr. Kishore Babu, Area Representative for Southeast Asia and Other Member States, ITU

Mr. Kishore Babu, Area Representative for Southeast Asia and Other Member States, International Telecommunication Union, thanked the UN Mongolia House, MDDIC and Communications Regulatory Commission (CRC) of Mongolia for hosting the seminar. He highlighted the increasing role of Information and Communications Technologies (ICT) in achieving the goal of sustainable development at the global level and in LLDC in particular. Satellite systems significantly contribute in increasing resilience of ICT networks as well as in delivering opportunities in mitigating consequences of natural disasters and climate change.

In order to realize the full scope of advantages as potentially delivered by the satellite technologies, Mr. Babu further outlined, there is the need for the comprehensive regulatory framework. In this context the seminar should delineate these frameworks in the close dialog between manufactures, satellite operators and national regulators. The issues of spectrum management, service licensing, technological development, clear, transparent and innovative regulatory regimes are of the highest priority to be addressed during the seminar.

# I3. Welcoming remarks by Mr. Dulguun Damdin-Od, Executive Director, Secretariat, International Think Tank for LLDCs

Mr. Dulguun Damdin-Od, Executive Director, International Think Tank for LLDCs (ITT for LLDCs) Secretariat, welcomed delegates to Mongolia and expressed his gratitude to ITU for bringing this important dialog to ITT LLDC. The focus of the event was to discuss the role of satellite technologies and space services in digital transformation of LLDCs. These countries are characterised by their geographical isolation and lack of direct access to sea shore and submarine cables. Another obvious problem for the inland countries is the need to establish costly infrastructure of fibre-optic networks and rely significantly on the interconnection to





terrestrial telecom infrastructure of neighbouring states. Today 61% of LLDCs' population still lacks the basic Internet connectivity.

These facts underscore the importance of satellite technologies for LLDCs. The seminar will also draw attention to the role of these technologies in preparedness to natural disasters and recovering operations. Mr. Dulguun Damdin-Od also asked the participants to explore the potential of satellite systems in digital inclusion of inhabitants in the geographically remote areas. To accomplish this goal the auspicious regulation should be adopted by the national Administrations, in particular with regard to the low-orbit satellite constellations and services they are aiming on.

# I4. Welcoming remarks by Mr. Tsagaankhuu Sodovjamts, Director General of Communications Policy Implementation and Coordination Department of MDDIC

Mr. Tsagaankhuu Sodovjamts, Director General of Communications Policy Implementation and Coordination Department of MDDIC expressed the appreciation to all the participants of the seminar. He underlined the importance of ICT in delivering connectivity to the remote and sparely populated areas of Mongolia. MDDIC endeavours in the efforts to incentivise the deployment of ICT infrastructure and to enable provision of the advanced services to the whole population of the country. In this context satellite technologies are playing ever increasing role in social life and different economic sectors.

Bearing in mind the needs of the rural and remote communities, Mongolia is planning to launch its national satellite system in the nearest future. Currently Mongolia is actively involved in the process of digital transformation in different economic and social sectors. Future national satellite system will further intensify this process. The seminar provides the convenient platform for the productive exchange of knowledge and solutions on how national satellite systems should be projected and launched to obtain the maximum of advantages for the society.

# I5. Welcoming remarks by Mr. Amgalan Zandraa, Communications Regulatory Commission of Mongolia

On behalf of the Communications Regulatory Commission (CRC) of Mongolia Mr. Amgalan Zandraa - Director General of the Radio Frequency Regulation and Monitoring Department – welcomed the participants of the seminar in Mongolia. Mr. Amgalan Zandraa emphasised that for the time being LLDCs were facing challenges in providing affordable connectivity especially in the countries with the extended landmass and low density of population. CRC of Mongolia has accumulated the experience on how to deal with these challenges. The opportunities of satellite systems to provide the cost-effective solutions for LLDCs will significantly complement the efforts already done.

To achieve the affordable and acceptable satellite services the encouraging national regulation should be adopted. CRC of Mongolia is proactive in this direction. Mr. Amgalan Zandraa noted that the seminar was the valuable event in sharing knowledge on how new regulatory methods could be introduced and wished the participants to have the fruitful discussion on these and other relevant matters.





### 1. Session 1. Developing a national satellite program: Background and considerations

With key technological advancements, satellite services have become much more relevant in the overall digital connectivity subject matter. With applications ranging from navigation, timing, Earth observation, environmental monitoring (weather, climate change), agricultural management, digital inclusion (rural and remote areas) amongst others, satellite services have become part of modern digital economy.

The economic impact of improved digital inclusion through satellite technology is substantial:

- **GDP Growth:** The World Bank estimates that a 10% increase in broadband penetration can lead to a 1.5% increase in Gross Domestic Product (GDP) for developing countries.
- **Job Creation:** The digital economy enabled by improved connectivity is expected to create 230 million jobs in Sub-Saharan Africa alone by 2030.
- **Education:** UNESCO estimates that connecting schools to the internet could help bring quality education to 500 million children globally by 2030.
- **Healthcare:** Telemedicine enabled by satellite connectivity could save developing countries up to \$21 billion annually in healthcare costs by 2030, according to a study by the Boston Consulting Group.

Session 1 was focused on introducing the overview of satellite services with historic changes and contemporary trends in Small Satellites (SmallSats) and CubeSats, High-Throughput Satellites (HTS), Reusable Rockets (SpaceX). Noting the technological evolution of satellite systems the session placed emphasis on the international and national regulatory development and on the best practices in these areas. Key considerations in developing a national satellite program were also the part of the session.

#### 1.1. US national satellite regulatory program

Mrs. Emma Marion shared the regulatory, licensing, and compliance principles as applied to the satellite systems and their services in the USA. She informed the participants on the mandates of authorities involved in the regulation of satellite systems and services. The Federal Communications Commission (FCC) regulates an access to non-federal spectrum, and an FCC authorization is typically required for satellites communicating with Earth Stations operating in the United States. The FCC also plays a key role in U.S. regulation of orbital debris mitigation.

In addition to the FCC, satellite licensing involves a variety of other federal agencies. As part of the FCC authorization process, the FCC coordinates spectrum use with the National Telecommunications and Information Administration (NTIA). The Federal Aviation Administration (FAA) licenses commercial launch and reentry vehicles well as commercial spaceports. Commercial remote sensing satellites require a license from the National Oceanic and Atmospheric Administration (NOAA). The Departments of Commerce and State license exports of space technologies. The Department of State also maintains a registry of the U.S. space objects.

Innovation in Small Satellites has advanced at a rapid pace over the past decade, but until recently satellite licensing procedures have lagged behind technological innovation, imposing significant regulatory and financial burdens on SmallSats operators during early stages of system development. In late 2019, FCC adopted rules creating a new, optional licensing process for SmallSats meeting certain criteria, such as a wet mass of 180 kg or less, a shorter





in-orbit lifetime, and a low orbital debris risk. Satellite systems meeting these and other criteria may apply for FCC authorization or U.S. market access under a streamlined application process with reduced fees, decreasing barriers to entry for qualifying operators and enabling the deployment of low-cost satellite systems. This new licensing process is in addition to the FCC's existing processes for satellite authorization, including its experimental (part 5), amateur (part 97), and standard commercial satellite licensing procedures (part 25). Small satellite operators seeking to provide service in the USA now have a variety of licensing options to choose from, and will need to select the licensing procedure that best matches their operational and spectrum needs.

#### 1.2. Economic development through national satellite programs

Mr. Bryce Kennedy ITU consultant on satellite technologies and regulation – delivered the presentation on the role of satellite programs as the catalysts for economic growth. He underlined that the economic impact of satellite technology had extended far beyond direct market value. Recent studies have shown that investments in space technology generate an average economic multiplier effect of 2.8 - meaning every dollar invested creates \$2.80 in economic benefits across various sectors. This multiplier stems from technology transfer, job creation, and the development of ancillary industries.

As the examples of the effective satellite programs Mr. Kennedy demonstrated the cases of Rwanda and Kenya. In 2019, Rwanda launched its first satellite - RwaSat-1 - designed for Earth observation, focusing on agriculture and disaster monitoring. Within two years Rwanda reported a 3.5% increase in agricultural productivity due to improved monitoring and resource management. Moreover, the satellite program has catalyzed the growth of Rwanda's tech sector, with a 15% increase in Science, Technology, Engineering and Mathematics (STEM) field university enrollments and the emergence of several space technology startups.

In 2018, Kenya launched its first satellite, 1KUNS-PF. This nanosatellite was designed for Earth observation and space weather monitoring. The economic impact has been significant. Within three years Kenya reported a 5% increase in agricultural productivity due to improved crop monitoring and resource management. The satellite data has been instrumental in enhancing weather forecasting accuracy by 30%, potentially saving millions of dollars in disaster prevention and response costs. The satellite program has catalyzed the growth of Kenya's tech sector, with a 20% increase in space-related startups and a 25% rise in STEM field enrollments at universities. By 2023, Kenya's space program had contributed to a 1.5% increase in GDP, demonstrating the broader economic benefits of space investment.

For landlocked developing countries in Asia-Pacific, these projections and case studies highlight significant opportunities. By investing in national satellite programs, these nations can:

- 1. Enhance agricultural productivity through precision farming techniques, potentially increasing yields by 10-15% as seen in countries like India that have leveraged satellite data for agriculture.
- 2. Improve natural resource management and environmental monitoring, crucial for sustainable development and climate change mitigation.
- 3. Strengthen disaster preparedness and response capabilities, potentially reducing economic losses from natural disasters by up to 30%, based on studies of satellite-based early warning systems.





- Boost telecommunications and internet connectivity in remote areas, which can increase GDP by 1.5% for every 10% increase in broadband penetration, according to World Bank estimates.
- 5. Develop high-tech industries and create skilled job opportunities, with the potential to create 5-7 indirect jobs for every direct job in the space sector, based on industry analyses.

Mr. Kennedy further underlined that developing effective regulatory frameworks was crucial for the success and sustainability of national space programs. This is particularly important for LLDCs as they seek to establish their presence in the space sector. A comprehensive legal framework provides clarity for both domestic and international actors, encourages investment, and ensures compliance with international obligations. Key elements of effective space legislation should include:

- 1. Licensing procedures for space activities.
- 2. Liability and insurance requirements.
- 3. Environmental protection measures.
- 4. Provisions for space debris mitigation.
- 5. Alignment with international space law.

As of 2024, global internet penetration stands at 66%, meaning that approximately 2.6 billion people still lack internet access. The disparity is particularly stark in developing countries, where only 53% of the population is online. For landlocked countries, the challenges of terrestrial infrastructure development often exacerbate this digital divide. Satellite technology is poised to play a crucial role in bridging this divide.

#### 1.3. Intelsat's participation in national satellite programs

Mr. Rajeev Kapoor – Intelsat, Director, Asia-Pacific – appraised the participants of the role of Intelsat in realization of national satellite programs in Asia-Pacific region.

One of the recent program is the project in Myanmar in 2016 – 2018 aimed to accelerate the deployment of the country's wireless communications infrastructure. Under the new multi-transponder agreement, Intelsat 39 hosts both C- and Ku-band satellite services for Myanmarsat-2 which enables the Government of Myanmar to significantly enhance its existing network as well as the networks of other mobile operators' and media companies. This will advance the expansion of affordable, high-speed broadband and internet connectivity to government agencies, businesses and communities throughout the country. It also supports and advances the local authorities of ensuring that 95 percent of its population will have access to broadband connectivity.

Mr. Rajeev Kapoor further noted that in order to ensure the efficiency of the satellite programs national Administrations should succeed in capacity building of their regulators as to engage the highly qualified staff. The latter should get knowledge and skills relevant to the procedures of obtaining orbital and frequency resource in ITU. It is also important to create clear spectrum planning frameworks in order to guarantee the availability of frequency resources and compliance with the coordination agreements with the concerned parties.

The next significant aspect for regulators is to guarantee the efficient commercial operation of satellite systems after the launch. The Administrations should take into account that once launched satellite system becomes the integral part of national critical infrastructure. In this context it should be regulated in due manner in order to maintain operation of national ICT infrastructure with the required resilience. The Administrations should also ensure that





operational costs are envisaged at least for 5-7 years of exploitation of traditional satellite system as it is the integral part of critical infrastructure.

Furthermore, Mr. Rajeev Kapoor draw attention of the Administrations and stakeholders to the rapidly changing technological landscape in the satellite industry. Today the innovative players are emerging (e.g. SmallSats, High Altitude Platform System (HAPS) etc.) influencing the operational, commercial and regulatory environment of the satellite industry. At the same time, the advanced satellite systems and technologies are affording additional opportunities for the markets and society and hence those should be further aided with the conducive regulatory frameworks.

# 1.4. Developing a national satellite program: Background and considerations. Satellite program of the Republic of Azerbaijan

Mrs. Sitara Mehdiyeva – Spectrum Management Division, Azercosmos – introduced the country case of Azerbaijan in unfolding its national satellite program. The speaker emphasized that due to active support of ITU nowadays all countries could get the allocation with the sufficient orbital and frequency resource for their national satellite programs. However, it doesn't preclude the need for the careful coordination process to be accomplished.

Azerbaijan has become the member of the countries' family operating their own satellites since 2013. Over the past 15 years the country has invested more than 600 million USD in its national satellite program. Today, Azerbaijan further extends its national satellite strategy. There are three major goals of future national strategy, namely, economic growth, establishing of space ecosystem, and space projects for peace and prosperity.

Mrs. Sitara Mehdiyeva has highlighted the significant role of international cooperation in satellite programs. For instance, the Administration of Azerbaijan collaborated actively with the Administration of Malaysia at the very early stage of searching for the orbital and frequency resource for the project. At the later stages the Administration of Azerbaijan submitted the application to ITU BR in order to be allocated with the required orbital frequency resource in compliance with the requirements of ITU. The coordination process was successfully completed. In practical undertakings in accordance with the ITU prescribed procedures Azercosmos' staff has gained the essential competences related to spectrum management in the satellite industry. The experience obtained allowed Azercosmos afterwards to suggest the training courses for other Administrations of the developing countries on the regulatory aspects of spectrum management in satellite industry.

For the time-being Azercosmos is extending its satellite program by creating the Spacecraft Development and Production LLC.. It will further enhance the knowledge base for the specialists of satellite industry sector in the country. This factor is essential in view of the planned futuresatellities with the focus to design and construct spacecraft for the upcoming satellite projects. The Spacecraft Development and Production LLC is also going to study the wide scope of subjects including space debris, new technological, operational and commercial opportunities of the satellite industry.

#### 1.5. ITU: International regulation of satellite systems

Mr. Aamir Riaz from ITU, introduced the landscape of international satellite related regulatory mechanisms to the participants of the seminar. Mr. Aamir Riaz focused attention on the ITU World Radiocommunication Conferences (WRC) as the background for the international regulation. The working methods and decision-making processes within ITU were described in details having the preparatory activity to and the results of WRC-23 as an instance.





Mr. Aamir Riaz provided an information to the delegates on the summary of WRC-23 decisions on agenda items relevant to satellite industry. In particular the decisions on agenda items:

- 1.1, 1.2, 1.3, 1.4 and 1.5 with regard to Fixed, Mobile and Broadcasting issues (incl. HIBS),
- 1.6, 1.7, 1.8, 1.9, 1.10 and 1.11 with regard to Aeronautical and Maritime issues (incl. suborbital flights, Unmanned Aircraft Systems, Global Maritime Distress and Safety System (GMDSS)),
- 1.12, 1.13, 1.14 with regard to Space Science issues (incl. Earth Exploration Satellite System (EESS) and Space Research Service (SRS)),
- 1.15, 1.16, 1.17, 1.18, 1.19, 7 with regard to GSO, NGSO and other satellite issues

#### were outlined.

Furthermore, the speaker analyzed the agenda of the forthcoming WRC-27 and highlighted the issues related to the satellite industry. The summary is illustrated in the Figure 1.1 below.

| 0   | FIXED-SATELLITE AND BROADCASTING-SATELLITE   | MOBILE-SATELLITE   |    |
|-----|--|--|----|
| 1.1 | Aeronautical/maritime earth stations in motion<br>47.2-50.2 GHz / 50.4-51.4 GHz                                | Space-to-space links<br>1 518-1 544 MHz / 1 545-1 559 MHz                    | 1  |
| 1.2 | 13.75-14 GHz – FSS earth stations with smaller antennas<br>51.4-52.4 GHz – Gateway earth stations for NGSO FSS | 1 610-1 645.5 MHz / 1 646.5-1 660 MHz<br>1 670-1 675 MHz / 2 483.5-2 500 MHz | -  |
| 1.4 | 17.3-17.7/8 GHz – FSS/BSS allocations in 17 GHz in Region 3  | MSS - IoT development  | 1  |
| 1.5 | Unauthorized operations of NGSO earth stations   | 1427-1432 MHz / 1645.5-1646.5 MHz 1880-<br>1920 MHz / 2010-2025 MHz          | 1. |
| 1.6 | 37.5-42.5 GHz / 42.5-43.5 GHz / 47.2-50.2 GHz / 50.4-51.4 GHz  | MSS - IMT- direct connectivity   | 1. |
| 7   | Satellite regulatory issues  | MSS – additional allocation  | 1. |
|     |  | Lunar communications   | 1. |
| 1.7 | 4400-4800 MHz / 7125-8400 MHz / 14.8-15.35 - IMT   | Radio Quiet Zones  | 1. |
| 1.8 | 231.5-275 GHz / 275-700 GHz - Radiolocation  | Space weather sensors  | 1. |
| 1.9 | Aeronautical mobile (OR) high frequency modernization  | ≥ 76 GHz – Earth exploration and radio astronomy                             | 1. |
| .10 | 71-76 GHz / 81-86 GHz - Power flux-density / power limits  | Earth exploration-satellite service<br>4200 – 4400 MHz / 8400-8500 MHz       | 1. |
|     | FIXED, MOBILE AND RADIOLOCATION  |  |    |

#### Figure 1.1 Satellite related issues within the agenda of WRC-27

It could be noticed that nearly 70% of topics to be discussed at WRC-27 are relevant to the satellite industry. It underscores the importance of satellite technologies in future decades at the global level. The Administrations and stakeholders are invited to participate in the work of ITU to determine the frameworks of international regulation for future satellite applications and services.





# 2. Session 2. Country case presentations on the national satellite programmes and regulatory mechanisms

The country case presentations at Session 2 of the seminar covered the following topics:

- country introduction, geography and why satellite program was needed;
- technical details on satellite program, e.g. coverage and services provided.
- national organization and coordination for satellite program management.
- policy and regulatory interventions required.
- competition with foreign satellite providers.
- financial sustainability mechanisms.
- how national satellite programs impact overall resilience of digital connectivity;
- examples of effective use cases: rural connectivity, backhauling, emergency connectivity etc.;
- any future advancements or plans.

#### 2.1. National satellite programs and regulatory mechanisms in Bangladesh

Mr. Mohammad Moniruzzaman Jewel - Director General, Spectrum Division, Bangladesh Telecommunication Regulatory Commission (BTRC) informed the meeting that satellite program became essential for enhancing connectivity, disaster management, and socioeconomic growth in Bangladesh. Bangladesh became the 57th country to independently operate a satellite with the launch of its first satellite, BS-1, on May 12, 2018. The key goals to be achieved in the country with the satellite program are:

- Improved telecommunications and connectivity;
- economic benefits and technological advancement;
- disaster management;
- national security.

For the time being national satellite network in Bangladesh is providing broadcast services, Very Small Aperture Terminal (VSAT) services, Internet and Intranet access, Direct-to-Home (DTH) services, backhaul/trunking, satellite telephony. It also supports defense applications, e-learning, disaster management, and tele-medicine applications.

BTRC is the key organization responsible for executing Bangladesh's first satellite project. BTRC's roles in the satellite program encompassed:

- licensing and spectrum allocation;
- coordination with the ITU and other global satellite regulatory bodies;
- monitoring and compliance.

Currently the Administration of Bangladesh develops the plan of diversification of satellite services by means of Remote Sensing and Earth Observation applications and satellite IoT services. As an example of further evolution of national satellite program Mr. Mohammad Moniruzzaman Jewel pointed out future Earth Observation System with optical satellites and Synthetic Aperture Radar (SAR) satellites. This will ensure the services for people in agriculture, marine, forestry, land/water observation, urbanization monitoring and emergency management.

#### 2.2. Satellite systems for Indonesia's digital transformation

Ms. Widiya HIDAYAT, Satellite Orbit Management Staff, Ministry of Communications and Informatics, informed the meeting that the Digital Indonesia Vision 2045 had been adopted





with the essential pledge on the satellite technologies. The importance of satellite technologies for Indonesia is driven by geographic and demographic conditions. Satellite systems are the best option for the unserved and underserved areas of the country.

The speaker pointed out that the major challenge for Indonesia was the gap between the demand and supply satellite capacity. The demand today exceeds the supply thus opening opportunities for the foreign satellites to provide services in Indonesia. In order to close the gap the well-conceived regulation is required. Today the Minister of Telecommunication and Informatics Regulation No. 21/2014 regarding the use of radio frequency spectrum for satellite systems is under review. The major objective of the revision is closing the gap between satellite supply & demand.

Revision of Regulation No. 21/2014 will redefine Indonesian satellite regulatory framework through providing opportunities for global satellites by means of landing right mechanisms for both GSO and NGSO. New regulation will enable incentives for additional investment, e.g. by mechanism of spectrum fees.

On other hand, the Government of Indonesia will further ensure balancing of the global trends, including mega satellite constellation, with the domestic interest. In this context it will promote partnerships & collaborations with local entities. The strategic demand for satellite capacity will be addressed through the government programs. The Government of Indonesia will ensure protection for the existing networks including imposing requirements for security, data protection, and access for monitoring & law enforcement.

# **2.3. Satellite communications in Malaysia: regulatory insights and future directions**

Mr. Ahmad Farhan Yamin Zulkifli - Head Licensing Department, Malaysian Communications and Multimedia Commission (MCMC) – shared the experience of Malaysia in introduction of national satellite programs. He noted that Malaysia's unique geography, with extensive rural areas and island territories, necessitated satellite coverage for remote connectivity and national security purposes.

Mr. Ahmad Farhan Yamin Zulkifli informed that Malaysia's National Space Policy 2030 had served as national agenda specific to space industry. It outlines strategic goals and initiatives aimed at developing the country's space capabilities and integrating space technology into national development. Key objectives include enhancing satellite capabilities, promoting space-based services for socio-economic development, and fostering local industry participation. The policy emphasizes education and capacity building to develop human resources and encourages research and innovation in space technology. Overall, it seeks to leverage space assets for national development and ensure responsible use of outer space.

Satellite development applications under Malaysia's National Space Policy 2030 include communication satellites enhancing telecommunications and internet connectivity across urban and rural areas, facilitating better access to information and services.

Regulatory Position on Satellite Services is aimed on rapid development of satellite technology and services and increasing interest in the provisioning of satellite services in Malaysia. Licensing requirements for satellite services, where communications satellites operator which intends to provide satellite-based connectivity services to Malaysian consumers, shall acquire the required licences or lease its satellite capacity through the local licensed service provider in Malaysia. Additionally, the network facilities and network services shall be based in Malaysia, specifically, the earth station and satellite hub must be located in the country. The





usage of foreign satellite by the licensed service provider in Malaysia is allowed subject to the local licensed service provider having the earth stations and satellite hub in Malaysia.

Currently, all Malaysian satellites are operated by MEASAT. MEASAT had launch Measat-3d satellite in June 2023 to provide sufficient and enhanced satellite capacity across Malaysia. Successful use cases include providing broadband to remote villages, disaster recovery communication after floods, and backhaul services to complement terrestrial networks.

#### 2.4. Pakistan space program and regulatory mechanisms

Mr. Abbas KHAN, Deputy Director Wireless Licensing, Pakistan Telecommunication Authority (PTA) and Ms. Shagufta MAHAR, Manager Frequency Coordination, Ministry of Information Technology & Telecommunication, provided the information on space projects, telecom policy and regulatory provisions in Pakistan. The speakers outlined that the fundamental provisions with regard to the regulation of the national satellite sector were included in the Telecom Policy 2015 (TP-2015). The speakers also shared technical details of the existing operational satellites as shown in Figure 2.1 below



#### Figure 2.1. Existing operational satellites in Pakistan

The Administration of Pakistan has undertaken two major policy and regulatory Interventions in the satellite sector recently.

1. National Space Policy was approved and notified in December 2023 with aim to:

- encourage use of space technology and applications for socio-economic development.
- enhance international cooperation and formulate national space legislation.
- facilitate the development of the local industry and commercialization of satellite products/services.

2. Pakistan Space Activities Rules were approved and notified in January 2024 with aimed on

- regulating the space industry in the country.
- registration of satellites operators providing services in Pakistan and protection of their rights
- support of local space industry.

Today Pakistan demonstrates the successful cases of satellite applications in rural connectivity providing broadband services in Baluchistan, Gilgit and other parts of the country.





Satellite applications are also beneficial in backhauling and emergency warning, disaster response (urban flooding), remote monitoring, navigation/determination services, E-education, E-health, etc.





# 3. Session 3. Introducing satellite service to market: challenges and solutions

Session 3 encompassed country presentations with the emphasis on:

- What key challenges are satellite connectivity meeting?
- What kind of satellite service is needed to resolve them?
- What does administration and regulator require from a foreign satellite operator to provide license?
- What international cooperation is needed?
- Any unique requirements as an LLDC or Small Island Developing States (SIDSs) (where applicable).
- Future plans.

#### 3.1. Satellite communications regulations and progress in Bhutan

Mr. Jigme WANGDI, Head, Bhutan InfoComm and Media Authority (BICMA) - highlighted that Bhutan as a small landlocked country in South Asia with a developing space sector is focused on harnessing space technology for sustainable development. BICMA oversees the regulation of telecommunications and satellite services licensing and allocation of satellite frequencies in the country.

Bhutan's First Satellite: BHUTAN-1, launched in June 29, 2018, launched aboard SpaceX's Falcon 9 rocket, The satellite was developed under the Japan-based BIRDS-2 Project, Satellite Type 1U CubeSat, and purposed for educational platform, Earth observation to monitor Bhutan's environment, focusing on forestry, agriculture, and water resources. Bhutan-IndiaSat launched in November 2022 was the country's second satellite. It is purposed for satellite for Earth observation, telecommunication, and disaster monitoring. Recently an ISO 7 standard clean room has been established in Bhutan where assembly, testing, and integration of small satellites can take place.

Mr Jigme pointed out that the Administration of Bhutan faces a list of challenges in the context of satellite systems as follows:

- Keeping up with the rapidly evolving global satellite technologies, industry and its regulations.
- Frequency allocations and sharing for Terrestrial and Satellite services.
- Dependency on foreign satellites.
- Limited human resource and technical capacity to regulate.

BICMA is endeavoring to adopt regulatory frameworks that facilitate the resolution of the challenges as listed above. For the time being the primary task of national satellite regulation and licensing is to ensure that radio frequency allocations and licensing for satellite services as well as spectrum fees are based on the National Radio Rules and Regulations (NRRR). A separate operational license/permit is required depending on the nature or type of services, e.g. an Internet Service Provider License for providing broadband satellite services. Earth Station requires a license for ground-based stations (satellite hub stations, satellite television broadcasting Earth stations etc.).

#### 3.2. Satellite programs status in Cambodia

Mr. Sopheak Cheang - Director General of RF Spectrum Management, Ministry of Posts and Telecommunications of Cambodia – summarized the challenges that should be overcome in





the country. The size and ecosystem of the satellite market in Cambodia is limited due to flat terrain, and the growth of terrestrial connectivity, and the decreasing demand of broadcasting industry. Satellite applications have been used very limitedly by the broadcasting company and foreign embassies. There is also a lack of training institutions and research facilities for satellite research, remote sensing, and space systems development. Most technical knowledge is imported rather than created locally. Clear national space policy to guide the development of space activities has not been adopted yet. Without a legal framework, there is no direction for investment, development, and international cooperation in satellite projects.

To tackle the tasks of national satellite programs the Administration of Cambodia is drafting a Ministerial Declaration on satellite coordination and licensing responsibilities along with a Ministerial Declaration on authorization of satellite user terminals. The Action Plan on promoting the satellite sector is also under consideration. The Action plan will include:

- **Building Satellite Ecosystem:** Partnership with global satellite agencies and regional networks to bring satellite ecosystem, starting from pilot project to local and/or global investments, promote to satellite-based services and increase connectivity via communication satellite to the remote areas where mobile service is often unreliable or unavailable.
- **Capacity Building:** Introducing of satellite-related education, technical training, and public awareness programs to build a skilled workforce.
- **Satellite Policy/Law:** Establish a clear national space policy and/or law, as it will promote satellite management and investment for the future.

#### 3.3. Satellite program development and policy in Lao PDR

Mr. Phoutthavanh Nathavong - Deputy Director, Satellite Communications Division, Department of Radio Frequency, Ministry of Technology and Communications (MTC) of Lao PDR – shared the experience of the Administration of Lao PDR in introducing national satellite program. The government is working to connect the rural areas and provide the basic ICT facilities and other government facilities through satellite, which is aimed at establishing a satellite communications network in Laos for the delivery of integrated communication services, for provide data, voice and video to the rural communities.

LAOSAT1 was launched on 21 November 2015 and operates 14 C-band transponders (Lao PDR and 15 countries in South East Asia) and 8 Ku-band transponders (Lao PDR with beside countries and Singapore). Today the main services of LAOSAT-1 are:

- DTH;
- Television Production Center;
- VSAT;
- National Emergency Communication Network.

The Government of Lao PDR promotes the use of Lao satellite communications by all eligible public and private sectors in their activities, contributing to the development of the economy, culture, society, national defense and security, disaster warning and relief, as well as scientific research, in an effective, efficient, safe, and fair manner. It encourages and promotes the use of satellite communications in various forms, utilizing new and advanced technology to bring the greatest benefit to society and the nation.

The Government also promotes cooperation with foreign countries, regional and international entities regarding satellite communications by exchanging knowledge on information, science,





technology, and human resource development, in order to advance and implement these tasks in accordance with agreements and international treaties to which the Lao PDR is a party.

#### 3.4. Satellite program in Nepal

Mr. Surendra Kumar Karmacharya - Manager, Chief Technology Officer, Nepal Telecom – outlined the major challenges of Nepal as the LLDC in providing connectivity with the consequent list of requirements to satellite systems to improve the situation in the country.

Nepal is a Landlocked Developing Country, which brings unique challenges and requirements for satellite services, connectivity, and international cooperation. The key challenge for Nepal is lack of terrestrial ICT infrastructure and dependence on satellite connectivity. Some villages in Nepal are situated at very high altitudes, around 4000 meters, in the Northern Himalayan region. Extending microwave links to these areas is not feasible because repeater locations would need to be placed at altitudes above 4500 meters. This poses significant challenges due to high operation and maintenance costs.

Based on the analysis of challenges with the connectivity Mr. Surendra Kumar Karmacharya elicits the following requirements to satellite systems to be applied in Nepal:

- **Satellite Internet Services:** VSAT satellite internet services are well-suited for delivering broadband connectivity in remote and underserved areas of Nepal, where terrestrial infrastructure is insufficient.
- **Satellite Telephony:** Satellite phones offer essential voice communication services, particularly in areas lacking cellular network coverage.
- Low-Earth Orbit (LEO) Satellite Networks: Since LEO satellites operate at significantly lower altitudes than traditional GEO satellites, they offer faster data transmission speeds and reduced latency. This makes them particularly well-suited for delivering internet services in remote areas, supporting digital education, healthcare, and emergency response efforts. Additionally, it is well-suited for supporting 4G and 5G services due to the comparatively lower cost of bandwidth compared to that of GEO bandwidth.
- Satellite-Based IoT (Internet of Things) Services: IoT devices connected through satellite can relay data on environmental conditions, resource utilization, and equipment status across various sectors, including agriculture, transportation, and infrastructure monitoring.
- Satellite Broadcasting: Broadcast satellites can deliver mass communication services for educational programs, health awareness campaigns, and television broadcasting to rural communities. Approximately 486 MHz of satellite bandwidth is utilized by Nepal's broadcasting industry, including FM radio, television, and DTH services.
- Search and Rescue Satellite Aided Tracking (SARSAT): Search and Rescue satellite systems are specifically designed to locate and rescue individuals in distress, especially in remote and hazardous areas such as Nepal's mountainous regions.

Nepal Telecom, the state-owned telecommunications service provider, has ambitious plans for satellite telecommunications to improve connectivity, bridge the digital divide, and enhance disaster management capabilities across the country. Nepal Telecom is likely to invest in high-speed satellite broadband, leveraging LEO satellite constellations for faster, more reliable internet services. These constellations, being developed by global operators like Starlink and OneWeb, offer low-latency internet, which is ideal for remote regions. Collaboration with global LEO satellite operators could be part of Nepal Telecom's strategy to offer faster and more affordable internet services.





#### 3.5. Satellite connectivity in Sri Lanka

Mr. Pamoaj Dharmasena – Assistant Director, Telecommunications Regulatory Commission of Sri Lanka – draw attention of the participants on the specific needs of Sri Lanka as a SIDS. Those are summarized as below:

- Accessibility and Affordability: Satellite services must be affordable and accessible to all segments of the population, particularly in remote and underserved communities.
- Local Capacity Building: Training and development programs are crucial to build local expertise in satellite technology and operations.
- **Financial Sustainability:** Sustainable business models are needed to ensure the long-term viability of satellite services in SIDSs.
- **Environmental Considerations:** Satellite operations should be environmentally friendly, minimizing potential impact on the natural environment.

Mr. Pamoaj Dharmasena has also emphasized the role of international cooperation in facilitating satellite programs in developing countries. Partnerships with international organizations and operators facilitate knowledge exchange and best practice sharing. International organizations can provide financial assistance to support satellite infrastructure development in Sri Lanka. Collaborations with foreign operators in the form of Joint Ventures can leverage their technical expertise and resources to expand satellite services.

The effective regulatory regime in Sri Lanka prescribes that foreign operators require licenses from the TRCSL to operate in Sri Lanka. They must obtain Type Approval for the devices planned to install at customer end. Operators need to comply with Sri Lanka's spectrum management regulations to ensure efficient use of radio frequencies. Operators must adhere to Sri Lanka's data protection laws and regulations, safeguarding user privacy and security.





# 4. Session 4: Trends in satellite connectivity and its regulations and future

Session 4 explored the latest technological trends in satellite connectivity, discussed the regulatory landscape, and anticipated future developments in these fields. Session 4 provided the opportunity to exchange views on:

- Growth of LEO satellites.
- HTS.
- D2D.
- Integration with 5G Networks.
- Mega-constellations.
- Enhanced Earth observation capabilities.
- Inter-Satellite Link technologies.
- Green satellite technologies.
- Regulatory challenges in access to markets and best regulatory models for market entrance.
- New business models.

#### 4.1. Amazon project Kuiper

Mr. Takashi MOTOHISA, Lead, License and Regulatory Affairs, Project Kuiper, Amazon delivered the most recent information on the objectives, technologies, expected market, and status of the project Kuiper. Project Kuiper is Amazon's initiative to provide fast, affordable broadband access to communities around the world that are currently unserved or underserved by traditional Internet and communications options. To achieve this goal, Amazon will deploy 3200 satellites in LEO linked to a global network of antennas, fiber, and Internet connection points on the ground. The network will serve a wide range of customers, including schools, hospitals, businesses, government agencies, and others operating in places without reliable connectivity or that need more flexible, resilient communications capabilities. Project Kuiper plans to deploy services to many countries around the globe.

Amazon began research and development on Project Kuiper in 2018. In July 2020, the U.S. Federal Communications Commission granted Amazon a license to deploy and operate Project Kuiper satellites. FCC license requires that Amazon deploys and operates at least half of satellite constellations by July 2026. Amazon launched its first two prototype satellites on October 6, 2023, and after achieving 100% success with that mission, expects to begin deploying satellite constellation in early 2025 and rolling out commercial services later in the year.

Project Kuiper has three main parts: ground infrastructure, satellites, and customer terminals. Amazon's ground infrastructure includes gateway antennas that securely send and receive customer data to and from satellites, along with Telemetry, Tracking, and Control (TT&C) antennas that keep the satellites properly operating. Global networking connects those gateway antennas to the internet, public cloud, or private networks. Satellites make up the second part of the project. They operate in LEO and relay data traffic to and from our gateway antennas and customers. Project Kuiper satellites will orbit between 590 and 630 kilometers. The satellites' proximity to the surface of the Earth means they can deliver fast service to customers, making Project Kuiper connectivity effective for uses like video calls, gaming, and high-definition streaming. The third part - customer terminals - are the technology that Project





Kuiper customers use to receive broadband service. The terminals combine antennas and processors into a single, compact system to deliver connectivity.

Space safety and sustainability are core tenets of Project Kuiper and have been from the initiative's inception. Those tenets have influenced everything from the overall architecture of Project Kuiper's satellite system to the design of the satellites themselves.

Amazon is designing the system to balance performance and affordability and plans to provide choice and flexibility by offering a range of options for customers. Amazon demonstrated three engineering model types of customer terminals In March 2023. The ultra-compact model provides speeds of up to 100 Mbps, the standard model delivers up to 400 Mbps, and the largest model, which is intended for enterprise, government, and telecommunications applications, delivers up to 1 Gbps.

#### 4.2. Softbank: NTN and HAPS towards beyond 5G/6G era

Mr. Osamu KAMIMURA, Vice President and Head of Spectrum Policy Office, SoftBank Corporation - acknowledged the meeting with the latest information on their Non-Terrestrial Networks (NTN) and HAPS projects on the way towards Beyond 5G/6G era. They underlined that in order to deal with different deployment situations, mankind needs to take varied measures to provide broadband access. Connectivity will be needed for Everything, Everywhere and at all Time. This need underlines the importance of NTN and determines the place of NTN in 6G environment as shown in Figure 4.1 below.



Figure 4.1. NTN mapping in 6G environment

According to the vision of Softbank, the future NTN will based on HAPS, LEO and GEO technologies.

Currently SoftBank undertakes numerous activities in practical implementation of different HAPS platforms. HAPS are stratospheric platforms and may include a variety of types - such as fixed-wing aircraft, balloons, and airships - that can provide a variety of connectivity and other services to end users on the ground. For example, HAPS can act as High-Altitude IMT Base Stations (HIBS) - providing connectivity directly to mobile handsets, modems and IoT devices using standard 4G/5G and future evolutions in the service-link. This solution can be





provided with network latency that is comparable to that of terrestrial cell towers, but with up to 200 times the geographic coverage from a single vehicle.

HAPS also can provide fixed wireless backhaul services or complement satellite connectivity. HAPS backhaul connectivity may include a HAPS-ground fixed link and/or a non-terrestrial gateway link (e.g., inter-HAPS or HAPS-satellite links), which may be used when it is difficult to deploy ground gateway stations.

The meeting was informed on recent development in HAPS technologies. The most essential of them are listed below:

- Japanese consortium achieves world's first demonstration of 5G communication from altitude of 4km using 38GHz band major step toward realization of 5G communication from stratosphere (May 2024).
- A consortium of Japanese businesses led by NTT DOCOMO, Inc. and Space Compass Corporation, together with Mizuho Bank Limited and the Development Bank of Japan Inc., has committed to invest USD\$100m in AALTO HAPS Limited subsidiary, which manufactures and operates the stratospheric, solar-powered Zephyr High Altitude Platform Station (June 2024).
- SoftBank Corp. and Enpower Japan Corp. successfully develop all-solid-state batteries with High Energy Density Batteries to achieve specific energy of 350 Wh/kg (July 2024).
- SoftBank Corp. announced its feasibility study on solar panel and storage battery technologies as part of "Research and Development on Long-Term Navigation Technology for High-Altitude Unmanned Aircrafts," in the research and development in the field "Development and Verification of Maritime Domain Awareness Technology Using High-Altitude Unmanned Aircraft". (September 2024).

SoftBank also supports the rights of national regulatory authorities to develop innovative, flexible policies and regulatory frameworks that advance HAPS deployment within their national borders while also ensuring coexistence of other services and avoiding cross-border interference. Next regulatory provisions with regard to HAPS are expected to be adopted by WRC-27.





### 5. Session 5: Partner to Connect (P2C)

The Partner2Connect Digital Coalition (P2C) is a global multistakeholder alliance launched in 2021 by ITU, in close cooperation with the Office of the Secretary-General's Envoy on Technology, and the UN Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Islands Developing States. Created in line with the UN Secretary-General's Roadmap for Digital Cooperation, the WSIS action lines and the Sustainable Development Goals, the purpose of P2C is to serve as a global platform to mobilize and announce new resources, partnerships and commitments for universal and meaningful connectivity in the hardest-to-connect communities in Least Developed Countries (LDCs), Landlocked Developing Countries (LLDCs) and Small Island Developing States (SIDS).

P2C Action Framework serves as the guiding document for the Coalition. The Partner2Connect online pledging platform, through which resources from public and private sector players around the world are being mobilized, now has 900 pledges made worth around USD 46.18 billion, submitted by 436 entities based in 142 countries around the globe.

Noting the unique nature of the ITU-ITTLLDC Seminar 2024, Session 5 provided a platform to focus on:

- Highlighting new and recent pledges made by stakeholders for the Asia-Pacific (Session 5a).
- Examination of specific opportunities linked to satellite-related P2C pledges (Session 5b).

Both Session 5a and Session 5b focused on matchmaking with interested entities, both in Mongolia and among other member states and entities participating in the seminar.

Given the advancement and new pledges made in P2C, the following key outcomes have been achieved:

1. Outcome 1 - **Azerbaijan** is interested in P2C pledges from E-Mongolia Academy (Pledge 2, 5a), Intelsat (Pledge 1,2,3,4 of 5b), GSOA (Pledge 11, 19 of 5b).

Outcome 2 - Sri Lanka is interested in P2C pledges from E-Mongolia Academy (Pledge 2, 5a)

3. *Outcome 3* - **Bangladesh** is interested in P2C pledges from E-Mongolia Academy (Pledge 2, 5a)

4. *Outcome 4 -* **Cambodia** is interested in P2C pledges from E-Mongolia Academy (Pledge 2, 5a)

- 5. Outcome 5 Bhutan is interested in P2C pledges from Intelsat (Pledge 1,2,3,4 of 5b)
- 6. Outcome 6 **Mongolia** is interested in P2C pledges from Huawei (Pledge 6,7, 8, 9 0f 5b)
- 7. Outcome 7 Indonesia is interested in P2C pledges from GSOA (Pledge 10, 5b)

8. *Outcome 8 - Nepal* is interested in P2C pledges from Intelsat (Pledge 2,3 of 5b), and Huawei (pledge6, 7, 8, 9 of 5b)

9. *Outcome 9 -* **Solomon Islands** is interested in P2C pledges from Intelsat (Pledge 2, 3, 5b) and GSOA (Pledge 10, 5b)

10. *Outcome 10* - **Intelsat and GSOA** are interested in P2C pledges from Azerbaijan's (Azercosmos) pledge to provide satellite training, and consultancy services, and foster international cooperation in the space industry.

#### 5.1. Session 5a: Bridging the digital divide through P2C





#### 5.1.1. Inclusive Digitalization Roadmap in Mongolia

Mr. Dulguun Damdin-Od, the Executive Director of the Secretariat for the International Think Tank for Landlocked Developing Countries (LLDCs), expressed the organization's full support for the ITU's Partner2Connect initiative and its efforts to promote inclusive digitalization. To contribute to this goal, the International Think Tank has launched a research project to develop an Inclusive Digitalization Roadmap for Mongolia. This roadmap aims to empower Mongolian civil society organizations to actively participate in policy discussions and advocacy campaigns that drive inclusive digital development.

The Think Tank consultant team has been diligently evaluating Mongolia's regulatory landscape and policies related to digitalization, determining to identify specific gaps and challenges that may hinder the efforts by civil society organizations in promoting digital inclusion. The roadmap will provide actionable recommendations and guidelines to equip these organizations with the necessary tools to enhance their advocacy, policy dialogue, monitoring, and professional capacity. Looking ahead, Mr. Dulguun emphasized that The International Think Tank plans to expand this research to benefit other landlocked developing countries and anticipates further collaboration with national institutes and international partners.

#### 5.1.2. Digital literacy initiative in Mongolia

Mr. Tulga Sukhdorj - Director of System integration department, at e-Mongolia Academy, highlighted the platform's significant achievements since its nationwide implementation four years ago. E-Mongolia manages the state information exchange and authentication systems, along with 29 other government systems, now serving 1.9 million active users—making it the second most used application in Mongolia. Over 326 systems are connected to the E-Mongolia authentication system, and 754 APIs are available for organizations to use government and citizen information without needing to contact each other directly. The platform has successfully digitalized 1,251 government services, saving an estimated \$336 million over the past four years and allowing seamless information exchange among over 326 connected systems.

E-Mongolia has evolved through four versions, enhancing features like digital documents, accessibility for users with disabilities, and AI functionalities and smart notifications. The platform has received international recognition, including awards from Estonia and Dubai, and improved its global ranking significantly. Looking ahead, the speaker emphasized the e-Mongolia Academy pledged to offer consulting services, technology innovation, AI project implementation, and knowledge sharing to other countries that have similar citizens aiming to develop similar digital platforms, with an estimated contribution valued at \$5 million, potentially reaching 30 million people.

Mrs. Gantulga Unurtsetseg – Head of digital literacy department, e-Mongolia Academy – informed the meeting that the mission of the project is for Mongolians to become an "E-Nation", to implement comprehensive measures for supporting the e-transition of the government and digitalizing the government services and activities by introducing advanced technologies and international best practices.

The speaker emphasized that the significant task of e-Mongolia was to develop laws, standards, regulations, long mid-term strategic plans in the fields of telecommunications, information technology, post, broadcasting, radio frequency, space technology, and cyber security. To tackle this task e-Mongolia Academy conducted a research and analysis, ensured the coordination of development policies and provided guidance to the entities involved.





On the technical side e-Mongolia Academy localized modern advanced techniques and technologies of communication, radio frequency, satellite, post, broadcasting, space technology. Based on these technologies a number of projects was developed and implemented. For instance, the digital literacy training course was developed. In the period 2021 – 2024 more than 67750 citizens participated in the course.

Today the e-Governance project is actively implemented with the major objective to organize and coordinate the activities for the implementation of laws, development policy documents and projects related to the development of information technology, governmental e-services, extension of public information infrastructure etc.

#### 5.1.3. Partner2Connect pledges by DITRDCA relevant to Mongolia

The Department of Infrastructure, Transport, Regional Development, Communications and the Arts (DITRDCA) of the Government of Australia coordinates and provides funding for two P2C pledges relevant to Mongolia.

The first is Connect2Recover "Digital Infrastructure and Ecosystem Reinforcement Against COVID-19 in Asia Pacific". It is the project that leverages ICTs to promote recovery from the impact of COVID-19 in the Asia Pacific by implementing activities to address the development of resilient connectivity; affordable access to ICTs; and safe use of online services. The second is "Child Online Protection (COP) for Asia-Pacific". It aims on strengthening of COP frameworks in selected Asia-Pacific countries by developing guidelines, building human an institutional capacity, and enhancing stakeholder engagement and cooperation.

Under the Connect2Recover project 9 Target beneficiary ASP countries (Lao PDR, Bhutan, Nepal, Philippines, Mongolia, Tonga, Sri Lanka, Fiji, Indonesia) are covered. Today there are 13 completed activities:

- 8 Country Assistances and assessments Tonga, Mongolia, Sri-Lanka, Nepal, Bhutan, Lao Philippines, Fiji.
- 5 Events: RRS-22 ASP, LMC ASP, ITU-PITA Emergency Telecommunications Readiness, ICT Infrastructure Resilience Testing, AMS Masterclass 2023, Masterclass on Broadcasting and MHEWS 2024

One publication is in process – "Study Resilient National ICT infrastructure: Considerations based on Gap assessments in Asia and the Pacific".

Child Online Protection for Asia and the Pacific project had already covered Bhutan, Thailand, Mongolia, Indonesia, Pakistan, Cambodia, Timor-Leste. It is ongoing in India, Nepal, Philippines. The major outcomes of COP project are summarized below:

- Translated versions of the ITU COP Guidelines (Bahasa Indonesian, Mongolian and Thai). Bhutan localized version of the ITU COP Guidelines.
- 3 UN2UN Agreements on COP with UNICEF Thailand, Bhutan and Mongolia deployed COP in the countries.
- Organized a series of national COP conferences, focus group discussions, workshops and trainings.
- 4 COP National Assessment Reports with policy recommendations for Bhutan, Mongolia, Pakistan and Thailand. Support the development of the presidential COP Roadmap in Indonesia.

#### 5.2. Session 5b: P2C, connectivity, and satellite-related opportunities





#### 5.2.1. Azerbaijan (Azercosmos ) pledges: satellite training & source cooperation

Ms. Sitara Natavan Hasanova, the Strategy & Business Development Director of Azercosmos, expressed Azercosmos' interest in submitting a new pledge focused on developing and providing satellite training programs in areas such as spectrum management, strategy, satellite operation, GIS solutions, and consultancy services. She emphasized that the primary goal of this pledge is to strengthen source cooperation.

#### 5.2.2. Intelsat P2C pledges

Mr. Rajeev Kapoor – Intelsat, Director, Asia-Pacific – updated the information on the pledges committed by Intelsat. The objectives and current status are summarized below.

#### Pledge 1:

## Facilitating digital inclusion: The future of global connectivity through a truly global multi-orbit unified network

| Objective  | Status  |
|--|---|
| Intelsat pledges to set the standard in            | Through the commercial agreement with               |
| uninterrupted global broadband service by          | Oneweb (signed in 2022) IntelSat is able to         |
| offering simplified connectivity through its       | provide robust and reliable multi-orbit             |
| ecosystem of software-defined, multi-orbit 5G      | connectivity combining the breadth of GEO with      |
| unified network. This unified system enables       | the global coverage and low latency benefits of     |
| seamless, easy-to-deploy, end-to-end services      | LEO, all accessible via one set of smaller, lighter |
| across different technologies and infrastructures. | weight equipment and, most notably, a new           |
|  | electronically steered array antenna.               |

#### Pledge 2:

#### Facilitating digital inclusion : Using connectivity as a fundamental tool for education

| Objective   | Status   |
|---|--|
| Intelsat pledges to utilize its Wi-Fi internet access | Implementation of the Pledge is underway.            |
| solutions to connect 100 schools in rural and         | Progress and target date to be met. Countries        |
| remote areas by 2025 in the context of the GIGA       | where this pledge is being implemented are:          |
| initiative launched by UNICEF and the ITU.            | Burundi (10 schools), Central African Republic       |
| Connected schools help develop digital literacy       | (5), Mali (5), Malawi (5), Niger (10), Tanzania (5), |
| among young adults and become anchor points           | Zambia (5), Zimbabwe (10), Cambodia (5), Lao         |
| for communities, local businesses and services.       | PDR (5), Mongolia (5), Nepal (5), Philippines (5),   |
|   | PNG (5), Timor Leste (5)                             |

Pledge 3:

#### Facilitating digital inclusion: Providing relief during natural or human-made disaster

| Objective  | Status  |
|--|---|
| Under the pledge of inclusion Intelsat pledges to<br>sign a Memorandum of Understanding providing<br>up to \$500,000 of airtime, as well as the<br>necessary equipment to be utilized during<br>disasters. | Implementation underway and target date to be<br>met. Agreement between ITU and Intelsat on the<br>implementation of this pledge under discussion |

#### Pledge 4:

#### Case studies on satellite connectivity as a tool for digital transformation

| Objective   | Status                                    |
|---|---|
| Intelsat's final pledge will offer white paper to | Implementation of the pledge in progress. |
| illustrate space sustainability and provide case  |   |





| studies and best practices on satellites as a tool | White Paper on "Satellite Connectivity: the Key     |
|--|---|
| for digital transformation.                        | for Digital Transformation in Africa was officially |
|  | launched on the 8th of November. Revised            |
|  | version of this White Paper launched in             |
|  | November 2023                                       |
|  | White Paper on "Satellites contribution to          |
|  | decarbonization" launched in 2023.                  |
|  | White Paper on "Unlocking Global Gateway in         |
|  | Africa: A roadmap" finalized and to be launched     |
|  | in Q4 2024  |

#### 5.2.3. SoftBank P2C pledges: carbon-neutral & HAPS

Mr. Osamu Kamimura - SoftBank Corp. - acknowledged the meeting on the P2C on Carbon-Neutral&HAPS from SoftBank.

SoftBank Corp. is striving to achieve virtually zero greenhouse gas emissions by 2030 under "Carbon-neutral 2030" by switching the power used for business activities to virtual renewable energy and utilizing cutting-edge technologies for energy conservation. In order to reduce greenhouse gas emissions, SoftBank is switching to electricity from substantial renewable energy supplied by the subsidiary SB Energy Corp. and has achieved the goal of switching 30% of the electricity used by base stations to substantial renewable energy by fiscal year 2020 and more than 50% by fiscal year 2021.

In addition, SoftBank is working to reduce greenhouse gas emissions by gradually switching to substantially renewable energy sources for power used by facilities and equipment other than base stations, and we are also working to reduce power consumption by further saving energy in network facilities through the replacement of energy-saving equipment and more efficient air conditioning systems.

Also, SoftBank builds the HAPS system, which provides a communications network from the sky, and developed an unmanned aircraft called the "Sunglider" that can continue to fly in the stratosphere. SoftBank aims to realize infrastructure with a low environmental load by providing stable flight and communication services through the development of solar power generation and storage technologies.

#### 5.2.4. Huawei P2C pledges: progress and other initiatives

Mr. Mankhtuvshin Erdenebileg - ICT Solution & Sales Dept, Huawei Mongolia – informed the meeting that Huawei had submitted a range of pledges mainly covering connectivity, infrastructure, and skills. All of the pledges are ongoing with traceable progress with partners. Apart from submitted pledges, Huawei has been working closely with Asia Pacific local government and partners to promote digital economy.

Pledges by Focus Areas and Pillars Pledges by region of origin - Digital Innovation & Entre Digital Economy 7 \$610.00K CIS 14% stimated Value Apps & Services Digital Inclusion Africa 14% Infrastructure 4 4 Cybersecurity Relevant / Local Asia & the Pacific Affordability Skills

The taxonomy of Huawei pledges is shown in Figure 5.1.





Table 5.1 P2C Huawei Pledges

#### Figure 5.1. Huawei pledges by focus areas and by region of origin.

Table 5.1 below also provides the list of pledges of Huawei along with the description and approaches to accomplish those.

| Area       | Pledge Type  | Description  | Approach   |
|------------|--------------|--|--|
| Kenya      | Programmatic | Enhance digital inclusion in<br>Kakamega County through<br>e-learning, telemedicine<br>and online jobs at TVETs<br>and Hospitals                     | Provide Wi-Fi connectivity and suitable<br>smart devices for 2 Hospitals and 2<br>technical and vocational education and<br>training (TVETs) in Kakamega County.<br>Improve education for 1,250 TVET<br>students and enable 3,000 local citizens<br>to access internet |
| Global     | Financial    | ITU Generation Connect<br>Youth Leadership Program<br>with Huawei  | Support 90 young visionaries (ITU GCYLP) in their digital inclusion projects   |
| Global     | Programmatic | Implementation of ICT<br>projects in various regions<br>by committing at least 150k<br>USD for partnerships  | Establish partnerships and resource<br>mobilization to implement at least<br>\$150,000   |
| Cambodia   | Programmatic | Provide 10,000 training<br>opportunities for ICT<br>professionals in Cambodia<br>by 2027   | Work with government departments<br>through the Ministry of Posts and<br>Telecommunications and universities to<br>provide 10,000 training opportunities for<br>ICT professionals from 2022 to 2027  |
| Global     | Programmatic | Bring connectivity to about<br>120 million people in<br>remote areas globally by<br>2025   | By the end of 2025, Huawei's ICT<br>solutions (including RuralStar) will bring<br>connectivity to about 120 million people in<br>remote areas across more than 80<br>countries   |
| Thailand   | Policy       | Thailand is targeting entry<br>level fixed broadband<br>service pricing to be below<br>2% of monthly GNI per<br>capita                               | Support Thailand's NBTC regulator and operators to promote fix broadband services especially in rural areas  |
| Uzbekistan | Programmatic | Creation of independent<br>testing laboratories to<br>confirm the conformity of<br>information security<br>products in the Republic of<br>Uzbekistan | Join as one of the contributors to promote<br>secure and inclusive connectivity,<br>network coverage in unconnected areas  |

#### 5.2.5. GSOA P2C pledges: connectivity & satellite-related opportunities

Mrs. Isabelle Mauro is Director General of the Global Satellite Operators Association (GSOA) shared the contribution of GSOA in P2C pledges. GSOA today represents the interests of 70 members in the satellite ecosystem. By pledging in P2C GSOA leads the industry efforts to





deliver on the ITU and Member States levels connectivity goals bringing meaningful connectivity and bridging economic, gender and digital divides.

GSOA commits to a set of pledges.

**1. Socio-Economic Benefits Pledge**: GSOA aims to double satellite connectivity to 500 million people by 2030, generating an estimated socio-economic benefit of over \$250 billion. This effort will spur innovation and integrate satellite technologies with terrestrial networks.

**2. Long-Term Growth Pledge**: The goal is to increase satellite data connections by 250% and the data consumed 15-fold by 2030.

**3. Satellite Playbook Pledge:** GSOA will prepare a Satellite Playbook to share best practices, case studies, and reference architectures to help close the digital divide and achieve universal connectivity.

**4. Affordable Satellite Connectivity:** Through trials, GSOA will demonstrate competitive and affordable satellite services to remote areas, supporting communities in least developed and developing countries.

**5. Tailored Workshops:** GSOA will organize workshops for ITU Member States focusing on the benefits of satellite services, disaster preparedness, and the integration of satellite services with 5G.

**6. Commitment to EW4AII**: The satellite industry will support the Early Warnings for All Initiative to ensure global emergency messaging by 2027, leveraging their experience and capabilities.

**7. Support for Emergency Connectivity:** The GSOA will facilitate agreements to ensure satellite connectivity during disasters, enhancing the ITU's mission to address the digital divide.

**8. Contributions to GIGA and Smart Villages:** GSOA pledges to support initiatives to connect unconnected communities and collect relevant data to ensure effective implementation.

**9. Sustainability Pledge**: The satellite industry commits to preserving the space environment by minimizing space debris through responsible satellite design and operation.





### Outcomes of the Seminar

#### Conclusions

1. The participants of the seminar designated a set of specific challenges for LLDCs in creating and maintaining their ICT infrastructure, as well as social and environmental factors, which had underscored the increased demand for satellite systems and applications. The most crucial of those are:

- A. Underdeveloped terrestrial telecom infrastructure (including backhaul), in the remote, rural, mountainous, and low populated areas.
- B. Limited civil utilities infrastructure available for terrestrial networks deployment.
- C. The need to rely on the infrastructure of the neighboring countries to have an interconnect to the outside global network.
- D. Power breakdown events, power backup issues etc.
- E. Bridging digital divide. Community in remote areas requires access to education, healthcare, and economic opportunities while businesses in these areas are seeking connections to global markets, enhancing production, trade, and tourism.
- F. LLDC are prone to natural disasters the need to ensure preparedness, relief operations and emergency response; the need to ensure network resilience.

2. The analysis of the contributions delivered by the representatives of national Administrations and stakeholders elicits additional factors that should be taken into account in future and existing satellite programs:

- A. Limited financial resources available for unfolding own national satellite projects and maintaining the operational satellite systems by LLDCs.
- B. Limited access to launch facilities, necessitating partnerships or innovative launch solutions.
- C. Potential cross-border frequency interference and coordination issues.
- D. Lack of comprehensive regulation facilitating the introduction of national satellite projects and streamlining access of foreign projects (landing rights) to the national markets. Need for the updated regulation relevant to LEO constellations.
- E. Need for regional cooperation in space-based disaster management and environmental monitoring.

3. The delegates outlined the opportunities for LLDC arising from the introduction of satellite projects. Inter alia, those include:

- A. Overcoming geographical limitations in communications and internet connectivity.
- B. Using Earth observation data for precision agriculture and natural resource management.
- C. Developing niche expertise in areas like data analytics or small satellite manufacturing.

4. The experience gained from the country cases shared by the participants of the seminar offers valuable lessons for LLDCs. National Administrations and stakeholders involved should:

- A. Focus on the areas that align with national strengths and development goals.
- B. Prioritize international partnerships to access expertise and resources.
- C. Invest in education and workforce development to build domestic capabilities.
- D. Implement flexible regulations that can adapt to rapid technological changes.
- E. Integrate space activities with broader national development strategies.

5. In order to close the digital divide, Partner2Connect highlighted the following key outcomes:





- A. Four new P2C pledges were presented as a result of this seminar, of which three were from Mongolian entities, the first time any P2C pledge was provided from Mongolia. Azercosmos also provided a new pledge.
- B. 30 expressions of interest in matchmaking were received from 11 entities during and after the event, for 13 of the P2C pledges presented. Further offline discussions will now be held between the pledgers and those who expressed interest, to further concretize the matchmaking.

#### Recommendations

Based on the results of discussions the following list of recommendations for policymakers in LLDCs was constituted:

- A. Establish a national space agency or dedicated space office within an existing regulatory institution to centralize space-related activities and regulation development.
- B. Develop a comprehensive national space policy that aligns with broader economic and social development goals.
- C. Invest in education programs and international scholarships to build domestic space expertise.
- D. Engage in regional and international space cooperation initiatives to access shared resources and knowledge.
- E. Implement streamlined licensing procedures to encourage private sector participation in space activities.
- F. Develop public-private partnership models to attract investment in space infrastructure and services.
- G. Prioritize the development of applications that address specific national challenges, such as agriculture, disaster management, or environmental monitoring.
- H. Establish a regulatory framework for spectrum allocation and management specific to satellite communications.
- I. Participate actively in international forums to ensure national interests are represented in global space governance discussions.
- J. Consider innovative funding mechanisms, such as space bonds or dedicated space investment funds, to support long-term space program development.
- K. Explore integration of satellite systems with terrestrial 5G and future 6G networks as a key development in ensuring communication resiliency. This hybrid network approach, often referred to as NTN, combines the global coverage of satellites with the high capacity of terrestrial networks.

By implementing these strategies and learning from global best practices, LLDCs in Asia-Pacific can create regulatory frameworks that support their space ambitions while promoting responsible and sustainable use of space resources.

#### Follow-ups in terms of resilience

From a regulatory perspective, ensuring communication resiliency through satellite technology requires several considerations:

1. Licensing frameworks: Streamlined licensing procedures for emergency satellite deployments can help ensure rapid response in crisis situations.





- 2. Emergency services integration: Regulations should mandate the integration of satellite communications into national emergency response plans.
- 3. Cybersecurity: As satellite networks become more integral to critical communications, robust cybersecurity regulations are necessary to protect these systems from potential attacks.

For LLDCs in Asia-Pacific, leveraging satellite technology for networks resiliency offers several benefits:

- 1. Reduced dependency on terrestrial cross-border infrastructure for international connectivity.
- 2. Enhanced disaster preparedness and response capabilities.
- 3. Improved ability to maintain essential services during crises.
- 4. Potential for new economic opportunities in satellite-based emergency services.

To fully capitalize on these benefits, policymakers in these countries should consider:

- 1. Developing national satellite communication strategies that include resilience planning.
- 2. Investing in ground infrastructure to support satellite communications.
- 3. Training emergency responders in the use of satellite communication systems.
- 4. Participating in regional satellite communication initiatives to share resources and expertise.
- 5. Incorporating satellite communication requirements into building codes and infrastructure development plans.

By prioritizing satellite technology in their communication resilience strategies, landlocked developing countries can significantly enhance their ability to respond to crises and maintain essential services, ultimately contributing to improved national security and economic stability.





### Annex 1: Agenda

## ITU - ITTLLDC Seminar – 2024

01 - 02 October 2024

Ulaanbaatar, Mongolia

## Program

|                 |  | DAY 1:  |  |  |  |  |
|-----------------|--|---|--|--|--|--|
| 09h15-<br>09h45 | Introdu<br>1.  | <b>iction and Opening</b><br>Mr Tapan Mishra, United Nations Resident Coordinator (UNRC) Mongolia   |  |  |  |  |
|                 | 2.   | Mr. Kishore Babu, Area Representative for Southeast Asia and Other Member   |  |  |  |  |
|                 | States, International Telecommunication Union (ITU), (Virtual)   |   |  |  |  |  |
|                 | 3. Mr Dulguun Damdin-Od, Executive Director, Secretariat, International Think  |   |  |  |  |  |
|                 |  | Tank for LLDCs  |  |  |  |  |
|                 | 4.   | Mr. Tsagaankhuu Sodovjamts, Director General of Communications Policy   |  |  |  |  |
|                 |  | Implementation and Coordination Department of Ministry of Digital Development,  |  |  |  |  |
|                 |  | Innovation and Communications (MDDIC)   |  |  |  |  |
|                 | 5.   | Mr. Amgalan Zandraa, Director General of the Radio Frequency Regulation and   |  |  |  |  |
|                 |  | Monitoring Department, Communications Regulatory Commission of Mongolia   |  |  |  |  |
| 09h45-<br>10h00 | Group Photo  |   |  |  |  |  |
| 10h00-<br>10h30 | Break  |   |  |  |  |  |
|                 | Sessio   | <b>n 1</b> : Developing a national satellite program: Background and considerations   |  |  |  |  |
| 10h30-<br>12h30 | With key technological advancements, satellite services have become much more relevant in the overall Digital connectivity. With applications ranging from navigation, Timing, Earth Observation, Environmental monitoring (weather, climate change) |   |  |  |  |  |
|                 | agricult<br>satellite  | e services have become part of modern digital economy.  |  |  |  |  |
|                 | The session would include focus on introducing the overview of satellite services with historic changes and would introduce modern trends Small satellites (smallsats) and CubeSats, High-throughput satellites (HTS), Reusable rockets (SpaceX).    |   |  |  |  |  |
|                 | The ses<br>practice<br>part of t   | ssion would also highlight the international and regulatory development and best<br>es. Key considerations in developing a national satellite program would also be<br>the session: |  |  |  |  |
|                 | Speake   | ers   |  |  |  |  |





|                 | 1. Ms Sitara Natavan Hasanova, Azercosmos  |
|-----------------|--|
|                 | 2. <u>Bryce Kennedy,</u> ITU   |
|                 | 3. Aamir – ITU (WRC-23 /27)  |
| 12h30-<br>14h00 | Break  |
| 14h00-<br>16h15 | <ul> <li>Session 2: Country Case presentations on the national satellite programmes and regulatory mechanism</li> <li>The country presentations would include: <ul> <li>Country introduction, geography and why was satellite programme needed</li> <li>Technical details on satellite programme e.g. coverage and services provided</li> <li>National organization and coordination for satellite programme management</li> <li>Policy and regulatory interventions required</li> <li>Competition with foreign satellite providers</li> <li>Financial sustainability mechanisms</li> <li>How national satellite programme impacts overall resilience of the digital connectivity.</li> <li>Any examples of effective use cases: rural connectivity, backhauling, emergency connectivity etc.</li> <li>Any future advancements or plans.</li> </ul> </li> <li>Speakers <ul> <li>Bangladesh</li> <li>Indonesia</li> <li>Malaysia</li> <li>Pakistan</li> </ul> </li> </ul> |
|                 | DAY 2:   |
|                 | Session 3: Introducing satellite service to market- Challenges and Solutions   |
|                 | The country presentations would include:   |
| 09h30-<br>10h45 | <ul> <li>Country introduction, geography and other relevant details e.g. population diversity etc.</li> <li>What key challenges need satellite connectivity</li> <li>What kind of satellite service is needed to resolve them</li> <li>What administration and regulator require from a foreign satellite operator to provide license?</li> <li>What international cooperation is needed?</li> <li>Any unique requirements as an LLDC or SIDs (where applicable)</li> <li>Future plans</li> </ul>  |
|                 | <ul> <li>Speakers</li> <li>Bhutan</li> <li>Cambodia</li> <li>Kiribati</li> <li>Laos</li> <li>Nepal</li> <li>Sri Lanka</li> </ul>   |





| 11h45-<br>11b15 | Break  |
|-----------------|--|
|                 | Session 4: Trends in Satellite connectivity and its regulations and future   |
| 11h30-<br>12h45 | <ul> <li>The session would explore the latest trends in satellite connectivity, discuss the regulatory landscape, and anticipate future developments in the field. This would target to include exchanges on:</li> <li>Growth of Low Earth Orbit (LEO) Satellites</li> <li>High-Throughput Satellites (HTS)</li> <li>D2D</li> <li>Integration with 5G Networks</li> <li>Mega-Constellations</li> <li>Enhanced Earth Observation Capabilities</li> <li>Inter-Satellite Link Technologies</li> <li>Green Satellite Technologies</li> <li>Regulatory Challenges in access to markets and best regulatory models for market entrance</li> </ul>  |
|                 | New business models  |
|                 | Speakers   |
|                 | 1. Mr Takashi Motohisa, Project Kuiper   |
|                 | 2. Mr Osamu Kamimura, SoftBank   |
|                 | Facilitator: ITU<br>Q&A  |
| 12h45-<br>14h00 | Break  |
|                 | Session 5: Partner to Connect (P2C)  |
| 14h00-<br>16h00 | The Partner2Connect Digital Coalition (P2C) is a global multistakeholder alliance<br>launched in 2021 by ITU, in close cooperation with the Office of the Secretary-General's<br>Envoy on Technology, and the UN Office of the High Representative for the Least<br>Developed Countries, Landlocked Developing Countries and Small Islands Developing<br>States (UNOHRLLS). Created in line with the UN Secretary-General's Roadmap for<br>Digital Cooperation, the WSIS action lines and the Sustainable Development Goals, the<br>purpose of P2C is to serve as a global platform to mobilize and announce new<br>resources, partnerships and commitments for universal and meaningful connectivity in<br>the hardest-to-connect communities in Least Developed Countries (LDCs), Landlocked<br>Developing Countries (LLDCs) and Small Island Developing States (SIDS). P2C Action<br>Framework serves as the guiding document for the Coalition. The Partner2Connect<br>online pledging platform, through which resources from public and private sector players<br>around the world are being mobilized, now has 900 <sup>1</sup> pledges made worth around USD<br>46.18 billion, submitted by 436 entities based in 142 countries around the globe. |
|                 | platform to focus on 1) Highlighting new and recent pledges made by stakeholders for<br>the Asia-Pacific, and 2) Diving into specific opportunities linked to satellite-related P2C<br>pledge.   |

<sup>&</sup>lt;sup>1</sup> As of 16 May 2024





Both sessions will also focus on matchmaking with interested entities, both in Mongolia and among other member states and entities participating in the seminar.

#### **Opening Segment (5 mins)**

1. Mr. Kishore Babu, Area Representative for Southeast Asia and Other Member States, International Telecommunication Union (ITU), (Virtual)

#### Session 5a: Bridging the digital divide through P2C (55 mins)

This session will invite P2C Digital Coalition partners to share details on the pledges made recently for Mongolia as well as for the Asia-Pacific.

Moderator: ITU

Speakers:

- 1. Ms. Unurtsetseg Gantulga, Director of Digital Literacy Department, E-Mongolia Academy
- Department of Infrastructure, Transport, Regional Development, Communications and the Arts (DITRDCA), Australia.

   Overview of DITRDCA pledges involving Mongolia provided by ITU

   Session 5b: P2C, Connectivity, and Satellite-related opportunities (55 mins)

This session will share international practices and pledges made by P2C Digital Coalition partners related to satellites and connectivity. It also invites new pledges from international and national entities, and to provide opportunities for matchmaking.

Moderator

Speakers

 Mr Rajeev Kapoor, Intelsat
 Mr Osamu Kamimura, SoftBank
 Mr. Munkhtovshin Erdenebileg, Huawei Mongolia
 Ms Isabelle Mauro, Director General, Global Satellite Operator's Association (GSOA) (Virtual)
 Closing

 ITU
 ITTLLDC

### Annex 2: List of Partner2Connect Pledges in Session 5, ITU-ITTLLDC Seminar 2024 -

| No.     | Name of the Pledge/<br>Commitment   | Details of Pledge   | Submitting Organization  | Туре     | Interest in<br>Matchmaking  |
|---------|---|---|--|----------|---|
| Session | 5a – New Pledges  |   |  |          |   |
| 1       | Development of Inclusive<br>Digitalization Roadmap in<br>Mongolia           | ITTLLDC commits to advancing digital connectivity and inclusion in Landlocked Developing Countries (LLDCs) by bridging the digital divide and ensuring that no one is left behind in the digital age.<br>ITTLLDC plans to conduct a research project with funding from People in Need (PIN) Mongolia, which aims to develop an Inclusive Digitalization Advocacy Roadmap, which serves as a key element to support civil society's efforts to engage in policy dialogue and advocacy campaigns to support inclusive digitalization policies, legislation, and regulatory frameworks. The findings will help inform decision-makers, stakeholders, and development partners to enhance the effectiveness and inclusion of digital transformation and the Government of Mongolia's "Digital Nation" plan.   | International Think Tank<br>for Landlocked<br>Developing Countries<br>(Mongolia) | Advocacy |   |
| 2       | Digital government platform<br>implementation service                       | E-Mongolia Academy pledges to improve government services around the world through digital transformation.<br>Mongolia will start this pledge by providing consultancy services regarding the implementation of nationwide digital government platform architecture including legal framework, infrastructure, cyber security, software development technology and project implementation methodology in various countries around the world.<br>The following steps are planned per our pledge for each country:<br>1. Sign MOU with local government<br>2. Sign consultancy agreement between 2 government<br>3. Initiate project implementation phase - Requirements, Implementation steps<br>Supervision, know how sharing<br>4. Project closing - Acceptance note, tender selection requirement etc.<br>5. Joint announcement of successful project<br>6. After 1-2 years follow up on project<br>The citizens of the target country will benefit seamless digital government services and will empower other<br>private institutions to improve current infrastructure and features of the platform. Legal framework changes,<br>investment opportunities and other benefits will occur as a direct result of the project.                                     | E-Mongolia Academy   | Advocacy | <ol> <li>Azerbaijan</li> <li>Sri-Lanka</li> <li>Bangladesh</li> <li>Cambodia</li> </ol> |
| 3       | ACCELERATING MONGOLIA'S<br>DIGITAL TRANSFORMATION<br>THROUGH DIGITAL SKILLS | <ul> <li>The COVID-19 pandemic accelerated digitalization, making technology vital for communication, collaboration, and learning. The e-Mongolia Academy, founded in 2022, seeks to enhance e-government services, reduce bureaucratic inefficiencies, and improve citizens' digital literacy. The organization strives to simplify the delivery of public services through the e-Mongolia platform.</li> <li>1. Assisting Visually Impaired People with Braille Equipment In Mongolia, over 12,000 people are visually impaired, with 95% of working-age individuals unemployed due to limited access to education and technology. The e-Mongolia Academy addresses this by providing braille laptops, allowing users to read, write, and access online information using screen readers. This initiative empowers the visually impaired, bridging the digital divide, boosting self-esteem, and increasing job opportunities by fostering independence and professional engagement.</li> <li>2. ICT Bus for Enhancing Digital Skills The ICT Bus promotes equitable access to technology education, particularly for seniors, people with disabilities, and residents in remote regions. The bus, converted into a mobile computer lab, offers Wi-Fi,</li> </ul> | E-Mongolia Academy   | Advocacy |   |

| No.     | Name of the Pledge/<br>Commitment  | Details of Pledge   | Submitting Organization | Туре      | Interest in<br>Matchmaking  |
|---------|--|---|-------------------------|-----------|---|
|         |  | LED screens, and specialized software to deliver essential digital skills training. By reaching underserved communities, it provides a more cost-effective solution compared to fixed-location training centers, ensuring those unable to access urban areas are not left behind.   |                         |           |   |
|         |  | 3. Computer Lab to Create a Digitally Safe Economy  |                         |           |   |
|         |  | The Academy plans to establish a computer lab focused on digital literacy and cybersecurity training.<br>Annually, the lab will train over 1,000 citizens, targeting seniors, students, and the visually impaired,  |                         |           |   |
|         |  | equipping them with skills to engage safely in the digital world and improving their online privacy and workplace abilities.  |                         |           |   |
| Session | 5b – New Pledges   |   |                         |           |   |
| 1       | Azerbaijan (Azercosmos) will<br>be submitting a pledge to<br>provide satellite training,<br>consultancy services, and<br>foster international<br>cooperation in the space<br>industry. | <ol> <li>Developing and providing satellite training programs in areas such as spectrum management, strategy, satellite operation, and GIS solutions.</li> <li>Offering consultancy services related to satellite technology.</li> <li>Strengthening international cooperation in the space industry.</li> </ol>  | Azerbaijan (Azercosmos) | TBD       | 1. Intelsat<br>2. GSOA  |
| Session | 5b – Pledges Presented for Mate  | hmaking   | 1                       | 1         |   |
| 1       | Case studies on satellite<br>connectivity as a tool for<br>digital transformation  | This pledge comprises the preparation of specific White Papers which will showcase case studies and best practices on the use of satellites as a tool for digital transformation as well as on the use of space in a sustainable way  | Intelsat                | Financial | 1. Bhutan<br>2. Azerbaijan  |
| 2       | Connectivity as a tool to<br>provide relief in case of<br>natural or man-made<br>disasters   | When a disaster strikes, and all the terrestrial infrastructure has been destroyed or damaged, satellite becomes the essential tool for those in affected areas.<br>Intelsat pledges to sign a MoU with the ITU through which it makes available up to \$500K of airtime as well as the necessary equipment to be utilized in case of natural or man-made disasters.  | Intelsat                | Financial | <ol> <li>Bhutan</li> <li>Azerbaijan</li> <li>Nepal</li> <li>Solomon</li> <li>islands</li> </ol> |
| 3       | Connectivity as a<br>fundamental tool for<br>education   | Connecting schools allows children to develop digital skills and access online learning content. Schools can<br>also become anchor points for surrounding communities: if you can connect the school, you can also connect<br>local businesses and services. This creates opportunities for service providers to generate revenue from<br>paying users, making connectivity more sustainable.<br>Intelsat pledges to utilize its Wi-Fi internet access solutions to connect 100 schools in rural and remote areas<br>in the context of the GIGA initiative by 2025  | Intelsat                | Financial | <ol> <li>Bhutan</li> <li>Azerbaijan</li> <li>Nepal</li> <li>Solomon</li> <li>islands</li> </ol> |
| 4       | The future of global<br>connectivity through a truly<br>global multi orbit Unified<br>Network  | Cellular backhaul over satellite enables mobile network operators (MNOs) more ways to provide<br>uninterrupted voice and data services to customers. It expands their coverage into more geographic areas<br>which were previously considered economically and feasibly beyond their reach. Satellite also has a key role<br>to play in combating terrestrial network outages. Back-up connectivity is much more than a nice-to-have.<br>While communications technologies reach even the most rural and remote areas, sustainability is still an<br>unsolved challenge. Involving local communities is critical to finding sustainable solutions that fit their needs,<br>financial situation, and ecosystem.<br>Intelsat's Unified Network is a unique and comprehensive, software-defined, multi-orbit global network and<br>ecosystem that will enable seamless, easy to deploy, end-to-end services across different technologies and<br>infrastructures. It will also enable deployment of terrestrial backbones in any village/city in Africa and<br>globally thus providing the connectivity solution for a timely access to collective users who may be further<br>connected via other terrestrial means to each satellite earth station<br>Intelsat pledges to deploy its Unified Network geostationary (GEO) service in a phased manner: | Inteslat                | Financial | 1. Bhutan<br>2. Azerbaijan  |

| No. | Name of the Pledge/<br>Commitment  | Details of Pledge   | Submitting Organization | Туре         | Interest in<br>Matchmaking |
|-----|--|---|-------------------------|--------------|----------------------------|
|     |  | <ul> <li>2023: Initial service, which can be used to extend MNO networks for carrier ethernet and cellular backhaul services, will be implemented by installing new ground station technologies on existing GEO wide beam and high-throughput satellites (Phase 1)</li> <li>2024-2025: Connectivity and feature capabilities will be enhanced and expanded, including 5G network compatibility, to fully leverage the capacity and flexibility of our Software-Defined GEO Satellites (Phase2).</li> <li>2025-2026: The GEO foundations established will be augmented with our medium earth orbit (MEO) constellation. (Phase 3)</li> </ul>   |                         |              |                            |
| 5   | Carbon-neutral 2030: towards<br>virtually zero greenhouse gas<br>emissions by 2030       | SoftBank Corp. is striving to achieve virtually zero greenhouse gas emissions by 2030 under "Carbon-neutral 2030" by switching the power used for business activities to virtual renewable energy and utilizing cutting-<br>edge technologies for energy conservation.<br>In order to reduce greenhouse gas emissions, we are switching to electricity from substantial renewable<br>energy supplied by our subsidiary SB Energy Corp., and has achieved the goal of switching 30% of the<br>electricity used by base stations to substantial renewable energy by fiscal year 2020 and more than 50% by<br>fiscal year 2021.<br>In addition, we are working to reduce greenhouse gas emissions by gradually switching to substantially<br>renewable energy sources for power used by facilities and equipment other than base stations, and we are<br>also working to reduce power consumption by further saving energy in network facilities through the<br>replacement of energy-saving equipment and more efficient air conditioning systems.<br>Also, we are building the "HAPS (High Altitude Platform Station)" system, which provides a communications<br>network from the sky, and developed an unmanned aircraft called the "Sunglider" that can continue to fly in<br>the stratosphere. SoftBank aims to realize infrastructure with a low environmental load by providing stable<br>flight and communication services through the development of solar power generation and storage<br>technologies.   | Softbank                | Advocacy     |                            |
| 6   | Huawei pledges to support 90<br>young visionaries in their<br>digital inclusion projects | The Generation Connect Young Leadership Programme in partnership with Huawei seeks to engage,<br>empower and inspire young people with vision, motivation and commitment towards supporting global<br>digital transformation efforts with concrete, implementable actions and projects aimed at empowering<br>people's educational and socio-economic development, in particular for those in vulnerable situations (such<br>as those from rural and remote, Indigenous, youth with disabilities, or from low income backgrounds).<br>To support the young fellows' journey in achieving their aspirations as digital leaders and changemakers ITU<br>and Huawei will provide young participants with mentoring and guidance support to strengthen their<br>knowledge and skills, as well as provide them with the necessary funding to enable them with the practical<br>implementation of planned projects with the main objective to generate impact at community level.<br>This pledge aims to support 30 STEM students or recent graduates aged 18 wo 28 annually for three years.<br>For these 30 STEM students, we aim to compose cohorts consisting of 50% of the winners are female (or at<br>least non-male) and 50% of the winners originate from developing countries (at least 20% from LDCs)<br>although they may now be studying (or permanently residing) in another country.<br>The ITU-Huawei project would have a 2-fold impact:<br>1. Offering funding and leading concrete developmental activities, directly benefiting in total 90 young<br>persons to become leaders of their own initiative and project which they can bring to reality.<br>2. Bridging digital divide of a number of people in vulnerable situations through youth-led initiatives/projects,<br>thus fostering the all-inclusive participation of youth from diverse backgrounds in creating a more inclusive<br>digital society. | Huawei                  | Programmatic | Mongolia,<br>Nepal         |

| No. | Name of the Pledge/<br>Commitment   | Details of Pledge   | Submitting Organization | Туре         | Interest in<br>Matchmaking      |
|-----|---|---|-------------------------|--------------|---------------------------------|
| 7   | Huawei pledges the<br>implementation of ICT<br>projects in various regions by<br>committing at least 150k USD<br>for partnerships           | Huawei pledges to establish partnerships and resource mobilization to implement projects through<br>enhancing the collaboration with international organizations across various regions to address specific<br>telecommunication/ICT priority areas. Huawei pledges to implement such agreements in various regions and<br>wishes to put forward at least 150,000 USD for this objective.   | Huawei                  | Programmatic | Mongolia,<br>Nepal              |
| 8   | Huawei pledges to provide<br>10,000 training opportunities<br>for ICT professionals in<br>Cambodia over the next five<br>years (2022–2027). | In Cambodia, the ITU's first P2C Partner Country, Huawei will work with government departments through the Ministry of Posts and Telecommunications and universities to provide 10,000 training opportunities for ICT professionals over the next five years (2022–2027).   | Huawei                  | Programmatic | Mongolia,<br>Nepal              |
| 9   | Huawei pledges to bring<br>connectivity to about 120<br>million people in remote<br>areas globally by 2025                                  | Huawei is committed to bridging the digital divide in remote communities. By the end of 2025, Huawei's ICT solutions (including RuralStar) will bring connectivity to about 120 million people in remote areas across more than 80 countries.   | Huawei                  | Programmatic | Mongolia,<br>Nepal              |
| 10  | Satellite Industry<br>Commitment to EW4All  | Satellites provide coverage to 99% of the world's geography and play a critical life-saving role in emergency messaging in all environments and geographies and is also able to provide reliable service in disaster situations that might render other technologies and communication mediums inoperable. The satellite industry has longstanding experience in emergency messaging and will be an essential component of any truly global emergency warning and messaging system. We are committed to the ambition of the Early Warnings for All Initiative for everyone to be protected by 2027. Under the leadership of GSOA, the satellite industry is committed to do its best efforts to supporting the ambitious goal of the EW4all initiative. This includes identifying opportunities and addressing challenges in the area of direct-to-handset. Through cross-sector collaboration and sharing of expertise and best practices, we will make progress in helping protect everyone. GSOA, in collaboration with key satellite partners, will work to assess and, as appropriate, address, the remaining challenges for the adoption of these life-saving technological solutions and applications. This could include reaching out to relevant stakeholders outside the satellite industry, including device manufacturers and standardization bodies, terrestrial service providers and other relevant trade associations. <i>"</i> * | GSOA                    | Advocacy     | Indonesia<br>Solomon<br>Islands |
| 11  | GSOA Socio-Economic<br>Benefits Pledge  | <ul> <li>"GSOA pledges its best efforts to contribute through its members to help double the number of people connected by satellite to at least 500 million people globally by 2030. This would result into an estimated global socio-economic benefit of more than \$250 billion and will continue fostering the unprecedented innovation in services, integration with terrestrial technologies, as well as backhaul and direct satellite broadband on land, in the air, and at sea, all of which have crucially positive impacts towards achieving the SDGs."</li> <li>GSOA will implement its pledge through the following activities by:         <ul> <li>Promoting and supporting ITU connectivity initiatives globally and regionally.</li> <li>Reinforcing capacity building and workshops to administrations.</li> <li>Enhancing collaboration and partnerships between NTN and TN Networks.</li> </ul> </li> </ul>   | GSOA                    | Advocacy     | Azerbaijan                      |
| 12  | GSOA Satellite Playbook<br>Pledge   | GSOA commits its best efforts to extend and increase the impact and efficiency of the ITU's mission to close<br>the digital divide and catalyse actions to achieve universal meaningful connectivity by preparing a Satellite<br>Playbook to connect the unconnected as a means of sharing concrete case studies, best practices and<br>reference architectures from GSOA members that can be replicated and scaled up within ITU Member States.  | GSOA                    | Programmatic |                                 |
| 13  | GSOA pledges to support<br>emergency connectivity   | GSOA commits its best efforts to extend and increase the impact and efficiency of the ITU's mission to close the digital divide and catalyze actions to achieve universal meaningful connectivity by facilitating agreements between satellite operators and the ITU to support the availability of satellite network connectivity during times of disaster where and when required   | GSOA                    | Programmatic |                                 |

| No. | Name of the Pledge/<br>Commitment | Details of Pledge   | Submitting Organization | Туре         | Interest in<br>Matchmaking |
|-----|-----------------------------------|---|-------------------------|--------------|----------------------------|
| 14  | GSOA pledges to boost             | GSOA commits its best efforts to extend and increase the impact and efficiency of the ITU's mission to close            | GSOA                    | Programmatic |                            |
|     | competitive and affordable        | the digital divide and catalyze actions to achieve universal meaningful connectivity by working with the ITU            |                         |              |                            |
|     | satellite connectivity            | to support trials to demonstrate competitive and affordable satellite connectivity for locations (villages,             |                         |              |                            |
|     |                                   | during 2022 - 2023  |                         |              |                            |
| 15  | GSOA pledges to organize          | GSOA commits its best efforts to extend and increase the impact and efficiency of the ITU's mission to close            | GSOA                    | Programmatic |                            |
|     | tailored workshops (minimum       | the digital divide and catalyse actions to achieve universal meaningful connectivity by organising tailored             |                         |              |                            |
|     | of 3 per year) for ITU Member     | workshops (minimum of 3 per year) for Member States in different ITU regions and sub-regions on:                        |                         |              |                            |
|     | States                            |   |                         |              |                            |
|     |                                   | a. The benefits and working of satellite services to connect unconnected communities                                    |                         |              |                            |
|     |                                   | b. The value of implementing ITU recommendations and guidelines   |                         |              |                            |
|     |                                   | c. The importance of disaster preparedness leveraging satellite services  |                         |              |                            |
|     |                                   | d. The value of satellite services to extend the benefits of 5G services and beyond                                     |                         |              |                            |
| 16  | GSOA pledges to contribute        | GSOA commits its best efforts to extend and increase the impact and efficiency of the ITU's mission to close            | GSOA                    | Programmatic |                            |
|     | to GIGA and the Smart             | the digital divide and catalyze actions to achieve universal meaningful connectivity by contributing to GIGA            |                         |              |                            |
|     | Villages initiatives              | and the Smart Villages initiatives by galvanizing GSOA members, gathering data, metrics and information on requirements |                         |              |                            |
| 17  | GSOA Long Term Growth             | The global satellite industry will work toward the objective of extending meaningful connectivity globally by           | GSOA                    | Advocacy     |                            |
|     | Pledge                            | connecting unconnected communities, schools, households, planes, ships, businesses, humanitarian                        |                         |              |                            |
|     |                                   | agencies, peacekeepers and governments, aiming to increase the number of satellite data connections by                  |                         |              |                            |
|     |                                   | 250% by 2030 & increase the data consumed by those connections 15-fold.   |                         |              |                            |
| 18  | GSOA Pledges to extend and        | GSOA commits its best efforts to extend and increase the impact and efficiency of the ITU's mission to close            | GSOA                    | Programmatic |                            |
|     | increase the impact and           | the digital divide and catalyse actions to achieve universal meaningful connectivity by serving as a platform           |                         |              |                            |
|     | efficiency of the ITU's mission   | for the exchange of information between administrations, regional organizations and satellite operators                 |                         |              |                            |
|     | to close the digital divide       | concerning the licensing and use of satellite communications on their territories.                                      |                         |              |                            |
| 19  | GSOA Sustainability Pledge        | The global satellite industry will work toward the preservation of the space environment for future                     | GSOA                    | Advocacy     | Azerbaijan                 |
|     |                                   | generations by designing, launching and operating satellites in a responsible way and minimizing the creation           |                         |              |                            |
|     |                                   | of space debris.  |                         |              |                            |