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RESPONSE FOR SOLUTIONS: "Space2030" Agenda Mid-term Review

Overarching objective [1]	**The Space Economy** **Actions to ensure space economy and high-level progress:** **1.1 Policy & Regulatory Frameworks** • The Kingdom of Bahrain has signed three of the five main international space treaties developed under the UN Governing Activities in the Peaceful Exploration and Use of Outer Space: Outer Space Treaty, Liability Convention, and Registration Convention. The Bahrain Space Agency (BSA) has also signed the Artemis Accords. • The BSA has drafted the national space law with relevant national entities to organize space activities and develop clear regulations for commercial space activities. The law will be announced in the coming years. **1.2 Infrastructure Development** The BSA has established a simple ground station to support AlMunther satellite communications, Earth observation, and data services. **1.3 Public-Private Partnerships (PPPs)** The BSA initiated discussions with private companies to co-fund satellite projects (e.g., IoT satellite). **1.4 Innovation & Technology Development** The BSA has collaborated with many national universities on joint research and projects such as the "Early detection of red palm weevil using space technologies" project in collaboration with a national university and 3 other partners. **1.5 Workforce Development** The BSA has launched many space education and outreach initiatives to train students, engineers, data scientists, and space entrepreneurs. Bahrain Space Agency has also offered internship opportunities and organized specialized stakeholder workshops workshop on space applications. **1.6 International Collaboration** The BSA has joined global initiatives like Artemis Accords to align with international space exploration goals, partnered with foreign agencies (e.g., NASA, ESA, JAXA) on joint missions and knowledge-sharing and advocates for open-access space data to enable global innovation (e.g., climate monitoring, disaster response). **1.7 Public Engagement & Awareness** The BSA has hosted many hackathons, competitions, and outreach programs to inspire public interest, targeting youth. BSA organized events highlighting the economic benefits of the space sector (e.g., Redwire workshop in 2024 for SMEs and University workshop in 2025 about space applications for sustainability for Government representatives, SMEs and academics).
Country/Observer Organization	Kingdom of Bahrain Bahrain Space Agency
Project partners	Bahrain Space Agency
Short Project summary and goals	The BSA has developed a 5-year plan to encourage investment and the establishment of start-ups, small and medium enterprises in the space sector in Bahrain. The plan includes guidelines, general objectives, specific goals, and performance indicators.

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Relevant SDGs	• SDG 4 (Quality Education): The plan includes space education and outreach for youth, including professionals and entrepreneurs. • SDG 8 (Decent Work and Economic Growth): The plan directly supports small and medium enterprises (SMEs) and startups. Furthermore, the plan stimulates job creation in high-tech sectors like space tech. • SDG 9 (Industry, Innovation, and Infrastructure): The plan fosters innovation and technology development in the space sector. • SDG 17 (Partnerships for the Goals): The plan's emphasis on public-private partnerships and international collaboration.
Space/Satellite solution:	• Upstream Industries: Foster PPP in the metal industry for satellites and components. • Downstream Industries: Foster SMEs in sectors like Agri-Tech, fintech, or logistics that rely on satellite data. • Export Opportunities: Enable startups to sell space-derived services (e.g., EO analytics) to global markets.
Project impact	• Economic Impact: Generate high-skilled jobs in satellite technology, data analytics, and space engineering, increasing economic diversification and contributing to economic growth and prosperity. • Technological Impact: Develop cutting-edge solutions to national and regional challenges. • Societal Impact: Inspire youth, building a future talent pool for the space sector and increasing awareness of space tech's role in solving everyday challenges. • Environmental Impact: Enable startups to leverage satellite data for environmental monitoring.

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Overarching objective [2]	**Space Society** **Actions to ensure Space Society objectives and high-level progress:** **2.1 Space education** • Between 2019 and 2023, the BSA secured 12 master's scholarships for Bahraini students in the UAE and UK. In 2024, secured 3 new master's degrees and 3 PhDs in the UAE and Bahrain. Notably, all recipients are under 35 years of age to empower young talent, and 40% of these scholarships were awarded to women, reflecting Bahrain Space Agency's dedication to fostering gender inclusivity in STEM and space-related fields. • BSA has collaborated with the Ministry of Education on embedding space subjects in the national curriculum and on short courses, events, local competitions, and space camps. • BSA has partnered with many national universities, on research, joint projects, events, and trainings. • BSA organized many space apps hackathons to engage youth; most notably is the NASA annual space apps hackathon. **2.2 Workforce development** The BSA organized over 30 stakeholder workshops on space applications for government entities, SMEs, and academics, including six in 2024 and one in 2025. Notably, the University of Leicester conducted two workshops in 2024 and 2025 on applying space technology for sustainability. **2.3 Public outreach** The BSA organized many events, and in 2024, the BSA published more than 70 articles on the agency's social media channels, organized 62 initiatives to raise community awareness of space applications, including 4 national competitions and hackathons, participated in more than 20 television and radio interviews, and published more than 150 press releases to introduce the agency and its achievements. **2.4 Research & Innovation** The BSA published more than 77 research papers since 2020. In 2024, the BSA published 29 scientific papers, 11 of which were in collaboration with educational and space institutions. Additionally, one of the agency's employees was selected as a mentor for international space research by the International Astronautical Federation (IAF) for the year 2025. **2.5 Policy & Advocacy** The BSA has signed the Artemis Accords to promote peaceful use and sustainability of outer space. The BSA organized 2 editions of the space forums on the sidelines of the Bahrain International Airshow and the International Space Forum at Ministerial Level (ISF) in 2024 in collaboration with the IAF and the Italian Space Agency (ASI).
Country/ Observer Organization	Kingdom of Bahrain Bahrain Space Agency (BSA)
Project partners	**1. NASA Space Apps Hackathon** Bahrain Space Agency, NASA **2. Space Camp** Bahrain Space Agency, Astronaut Al Worden Endeavour Scholarship

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Short Project summary and goals	**1. NASA Space Apps Hackathon** In 2024, the BSA organized the 6th Edition of the annual NASA Space Apps Hackathon in Bahrain, engaging over **400 local participants** (students, developers, and startups) in two locations in Bahrain University of Bahrain and Bahrain Polytechnic. Teams leveraged NASA's open-source space data to tackle global challenges. **2. Space Camp** The BSA organized the participation of four school students and a mentor in the U.S. Space Camp for three consecutive years (2021, 2023, 2025) through the Astronaut Al Worden "Endeavour" Scholarship. This nation-to-nation initiative aims to inspire youth to pursue STEM careers, particularly in engineering and space exploration, by providing hands-on educational experiences.
Relevant SDGs	**1. NASA Space Apps Hackathon** • SDG 4 (Quality Education): The hackathon engaged students in skill-building and collaborative problem-solving, promoting STEM education and lifelong learning. • SDG 9 (Industry, Innovation, and Infrastructure): Participants from Bahrain leveraged NASA's open-source data and technology to develop innovative solutions for global challenges, fostering technological advancement and infrastructure for problem-solving. • SDG 13 (Climate Action): Projects addressed climate-related challenges using space data, aligning with global climate action goals. • SDG 17 (Partnerships for the Goals): Collaboration between the BSA, NASA, University of Bahrain, and Bahrain Polytechnic exemplifies multi-stakeholder partnerships to advance sustainable development. **2. Space Camp** • SDG 4 (Quality Education): Allowed hands-on STEM education and mentorship inspired youth to pursue careers in space exploration and engineering. • SDG 5 (Gender Equality): Ensured equal access to the program for all students, regardless of gender, and welcomed participation from both public and private schools. • SDG 9 (Industry, Innovation, and Infrastructure): Prepared future innovators in space technology, fostering a skilled workforce for advancing scientific research and technical industries. • SDG 8 (Decent Work and Economic Growth): Empowered youth with technical skills, enhancing Bahrain's talent pipeline for high-value sectors like space and engineering. • SDG 17 (Partnerships for the Goals): A nation-to-nation initiative (U.S.-Bahrain) demonstrating international collaboration to achieve educational and workforce development goals.
Space/Satellite solution:	**1. NASA Space Apps Hackathon** Participants of the hackathon used open-source satellite data from several partners, including NASA, JAXA, ESA, and the Canadian Space Agency, to develop innovative solutions addressing global challenges. **2. Space Camp** The Space Camp emphasized STEM education and allowed participants to engage with space technology through rocket design, and space mission control.
Project impact	• Capacity Building Impact: Establishes a skilled workforce in STEM and satellite development. • Diplomatic Impact: Strengthens US-Bahrain ties, setting a precedent for future collaborations.

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Overarching objective [3]	**Space Accessibility** **Actions to ensure space accessibility and high-level progress:** **3.1 Develop Bahrain's national space policy prioritizing access to satellite data where possible.** National Space Policy announced in 2018 by the cabinet. **3.2 Launch scholarships, prioritizing women and youth, to study in the space disciplines field.** Between 2019 and 2023, the BSA secured 12 master's scholarships for Bahraini students in the UAE and UK. In 2024, secured 3 new master's degrees and 3 PhDs in the UAE and Bahrain. Notably, all recipients are under 35 years of age to empower young talent and 40% of these scholarships were awarded to women, reflecting Bahrain Space Agency's dedication to fostering gender inclusivity in STEM and space-related fields. **3.3 Partner with regional space agencies for joint training programs and knowledge exchange.** Between 2019 and 2024 BSA offered 11 specialized short-term trainings in the Netherlands (Twente University on data analysis), India (UNNATI program) and Russia (St. Petersburg Polytechnic University in space technologies). All of whom are below 35 years of age and 82% are women. **3.4 Organize space education and outreach programs with workshops and competitions targeting different segments of the society, prioritizing women and youth, using Arabic and English to engage diverse communities.** In 2024, the BSA organized 5 specialized workshops for stakeholders at the national level, secured the participation of 4 school students in the International Space Camp in the United States during the summer of 2025/2026, published more than 70 articles on the agency's social media sites in Arabic and English, and organized 62 initiatives to raise community awareness of space applications, including 4 national competitions and hackathons. **3.5 Adopt sustainable practices in space missions to protect long-term access to space.** The BSA have developed internal policies to ensure sustainable practices in space missions to protect long-term access to space. This includes mission design for safe end-of-life disposal, adoption of space debris mitigation practices, and collaboration on space situational awareness (SSA). BSA prioritizes efficient resource use, robust fail-safe systems, and responsible satellite registration with UNOOSA.
Country/ Observer Organization	Kingdom of Bahrain Bahrain Space Agency (BSA)
Project partners	Developed in partnership with international entities, including ISISPACE (Netherlands), and launched on SpaceX.

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Short Project summary and goals	AlMunther is Bahrain's first nanosatellite with innovative Bahraini technologies, designed, built, and operated by Bahrain's engineers in partnership with international experts, marking a historic milestone for the Kingdom's independent access to space. The satellite delivers medium-resolution Earth observation data directly to Bahrain's first ground station, supporting a range of applications including climate monitoring, urban development, and environmental change detection. Its onboard AI-powered data processing optimizes bandwidth use by pre-processing imagery in space, reducing the reliance on large ground data infrastructures and making data access faster and more efficient. Furthermore, AlMunther's integrated cybersecurity measures guarantee secure transmission of data, protecting national assets and building trust in Bahrain's space operations. Critically, the satellite has been a catalyst for human capital development where Bahraini young engineers were trained in satellite design, integration, testing, and operations, ensuring local expertise and sustainable operation of future missions. Knowledge gained from AlMunther is being embedded into national educational and research frameworks, enabling future innovators to leverage space data for solving local and regional challenges. Aligned with international sustainability and space governance frameworks, Bahrain also ensured AlMunther complies with debris mitigation standards, safe end-of-life disposal plans, and full registration with UNOOSA, preserving orbital space accessibility for all nations.
Relevant SDGs	• SDG 4 (Quality Education): Trains Bahraini engineers on satellite development, AI, and satellite operations, fostering local expertise in space tech. • SDG 8 (Decent Work and Economic Growth): Creates high-skilled jobs in Bahrain's emerging space sector and stimulates innovation-driven economic growth. Furthermore, AlMunther data and analysis studies may be used to introduce services. • SDG 9 (Industry, Innovation, and Infrastructure): AlMunther advances Bahrain's technological infrastructure through its AI-driven satellite capabilities and partnerships with global experts like ISISpace. Furthermore, the first EO ground station was built in Bahrain to monitor, operate, and control the satellite. • SDG 13 (Climate Action): Provides Earth observation data for Bahrain to monitor climate impacts (e.g., coastal erosion, urban heat) and supports evidence-based environmental policies. • SDG 17 (Partnerships for the Goals): Collaboration with ISISpace and SpaceX exemplifies international cooperation to advance sustainable space exploration. • SDG 14/15 (Life Below Water/Life on Land): Satellite imagery aids in monitoring marine ecosystems (e.g., coral reefs) and terrestrial environments (e.g., mangrove conservation).
Space/Satellite solution:	AlMunther utilizes low-cost, scalable satellite design to lower economic barriers, enabling emerging nations like Bahrain to participate in space exploration. AlMunther provides medium-resolution Earth imagery to deliver actionable insights (e.g., climate trends, urban planning). This mission embodies space's role as a shared resource that bridges geographic, economic, and social divides, advancing global sustainability and inclusive innovation.

Project impact	• Capacity Building Impact: Establishes a skilled workforce in satellite development, operations, data processing, and analysis. • Economic Impact: Lowers costs for future small satellite missions through proven 3U CubeSat technology. • Technological Advancement & Innovation: Onboard AI processing, cyber security. • Environmental and climate impact: AlMunther data support Bahrain's sustainability policies and global climate research.

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Overarching objective [4]	**Space Diplomacy** **Actions to ensure space diplomacy and high-level progress:** **4.1 Negotiate treaties/agreements.** The Kingdom of Bahrain has signed three of the five main international space treaties developed under the UN Governing Activities in the Peaceful Exploration and Use of Outer Space: Outer Space Treaty, Liability Convention, and Registration Convention. The Bahrain Space Agency has also signed the Artemis Accords. **4.2 Foster bilateral and multilateral partnerships.** During the past few years, the BSA have succeeded in establishing diverse partnerships to support efforts in the space sector. The BSA has established strong collaborations with more than 60 regional and international space entities that have resulted in joint projects, research, and knowledge transfer. **4.3 Identify the most prominent regional and international organizations, bodies, and federations specialized in the space field that serve the objectives of the agency and seek to cooperate with them.** **4.4 Represent the Kingdom in the most prominent organizations, committees, working groups, and conferences in the field of space.** The Kingdom of Bahrain is a member of relevant international space organizations such as UNOOSA, COPOUS, IAF, the Arab Space Cooperation Group (ASCG), the Space Generation Advisory Council (SGAC), the Space Committee of the World Economic Forum (WEF), the Space For Climate Observatory (SCO) and a stakeholder in UNOOSA Space4water initiative. **4.5 Seek to make Bahrain a regional and international hub for hosting diverse space events to facilitate partnerships.** The BSA organized two space forums on the sidelines of the Bahrain International Airshow in 2022 and 2024, in which participants included prominent figures from ISRO, UNOOSA, Azercosmos and UAESA. Furthermore, the BSA organized the hosting of the 6th edition of the International Space Forum 2024, for the first time in the Middle East and North Africa region, in the Kingdom of Bahrain. Furthermore, BSA hosted, for the first time outside the UAE, the Arab Space Cooperation Group (ASCG) meeting in 2022. Additionally, the BSA organized the second edition of the Middle East Space Generation Advisory Council (SGAC) Workshop. **4.6 Encourage peaceful use of space through non-military agreements.** All Bahrain Space Agency agreements are for civil space cooperation and promote the peaceful use of outer space. These agreements also resolve disputes diplomatically through many mechanisms, including arbitration. **4.8 Share Earth observation analysis with relevant entities to report on climate, support disaster response, and resource management.** The BSA provides satellite data and analytical studies that serve various vital verticals across the economy and contribute to the comprehensive and sustainable development of the Kingdom. These studies help various stakeholders report on commitments such as those related to climate, support disaster response, and resource management.

	4.9 Promote cultural exchange through space education and outreach initiatives. The BSA facilitated culture exchange through the participation of youth in different space programs abroad, including space camps such as the Astronaut Al Warden Endeavour Scholarship for 2 consecutive batches, the Space Challenges Camp in Bulgaria, specialized training programs such as the UNNATI program in India and satellite data analysis in TWENTE University in Holland.
Country/Observer Organization	Kingdom of Bahrain Bahrain Space Agency
Project partners	**1. Light 1 satellite project** • Bahrain Space Agency, Khalifa University (UAE). **2. Arab 813 satellite project** • 14 Arab countries. **3. CO2sat payload project** • Bahrain Space Agency, UK Partners (University of Leicester, Geospatial Insights). **4. AI-Rideshare project** • Bahrain Space Agency, Omanlens, StarVision. **5. Aman payload project** • Bahrain Space Agency, MBRSC, UNOOSA. **6. LunaHCAM payload project** • Bahrain Space Agency, EgSA, CNSA
Short Project summary and goals	**1. Light 1 satellite project** • The first Emirati-Bahraini 3U satellite, for the purpose of capacity building on the process of satellite design, assembly, integration, launch, and operations, and has a scientific objective: detection of gamma rays. • Objectives: i. Develop national technical expertise in satellite design, assembly, integration, launch, and operations. ii. Detect and study gamma rays to advance space science. iii. Strengthening regional collaboration. iv. Technological demonstration through validating the functionality of a 3U CubeSat platform. **2. Arab 813 satellite project** • The first space cooperation project between the Arab countries led by the UAE in which the BSA is participating in. The project is for capacity building and will result in building and launching an advanced EO small satellite intended to monitor earth, environment, and climate. • Objectives: i. Advance regional space cooperation under UAE leadership. ii. Develop technical expertise in advanced Earth observation (EO) satellite technology. iii. Deploy a state-of-the-art satellite for Earth, environmental, and climate monitoring. iv. Address regional environmental and climate challenges. v. Strengthen regional data governance and accessibility. vi. Reinforce the UAE's role as a catalyst for Arab space initiatives. **3. CO2sat payload project**

	• Project funded by the UKSA bilateral fund, in collaboration with UK partners to develop a payload for detecting greenhouse gas emissions in Bahrain and the wider Gulf region. • Objectives: i. Design and deploy a satellite payload to detect and measure greenhouse gas (GHG) emissions in Bahrain and the Gulf region. ii. Strengthen UK-Bahrain collaboration. iii. Enhance regional climate action. iv. Train Bahraini technical expertise in GHG monitoring and satellite technology. v. Align with international agreements (e.g., the Paris Agreement) by improving transparency emissions. vi. Highlight cost-effective solutions for monitoring emissions in arid Gulf environments. **4. AI-Rideshare project** • The project will result in launching an AI algorithm for onboard data processing StarVision and Omanlens satellites as part of the AI rideshare program. • Objectives: i. Create a lightweight, efficient AI model capable of real-time data analysis on satellites. ii. Reduce latency and bandwidth usage by processing data onboard. iii. Foster cross-border collaboration (Bahrain, Oman, China). iv. Validate AI performance in space. v. Reduce energy consumption and data waste through smart processing. **5. Aman payload** • Winner of the UNOOSA and MBRSC Payload Hosting Initiative (PHI) during the IAC in 2022. The payload will secure satellite images and data by implementing an optimized novel encryption algorithm. • Objectives: i. Create a novel, lightweight encryption method to secure satellite imagery and data. ii. Safeguard sensitive Earth observation data during storage and transmission. iii. Leverage the UNOOSA-MBRSC partnership to advance global space security standards. iv. Set new benchmarks for data security in satellite systems. v. Support global data governance frameworks. **6. LunaHCAM payload project** • This project is a result of the BSA's collaboration with the Egyptian Space Agency (EgSA) winning the International Scientific Payload Hosting Opportunity, which is hosted by the Chinese National Space Administration (CNSA) onboard the Chinese Chang' E-7 orbiter. The payload is to identify surface materials of the moon using a hyperspectral camera. • Objectives: i. Map Lunar Surface Materials with Hyperspectral Imaging ii. Deepen partnerships between Bahrain Space Agency (Bahrain), EgSA (Egypt), and CNSA (China) in lunar exploration. iii. Advanced Hyperspectral Technology for Planetary Science. iv. Identify potential resources for future in-situ resource utilization (ISRU). v. Build national expertise in Planetary Science

	vi. Contribute to Global Lunar Science and Exploration
Relevant SDGs	**1. Light 1 satellite project** • SDG 4 (Quality Education): Capacity building in satellite technology. • SDG 9 (Industry, Innovation, and Infrastructure): Advances in satellite design, integration, and operations. • SDG 13 (Climate Action): Indirectly supports climate science through gamma-ray detection (space weather research). • SDG 17 (Partnerships for the Goals): Emirati-Bahraini collaboration. **2. Arab 813 satellite project** • SDG 4 (Quality Education): Capacity building in satellite technology. • SDG 9 (Industry, Innovation, and Infrastructure): Advances in satellite design, integration, and operations. • SDG 13 (Climate Action): Monitors climate and environmental changes. • SDG 14 (Life Below Water): Ocean monitoring (if applicable). • SDG 15 (Life on Land): Terrestrial ecosystem observation. • SDG 17 (Partnerships for the Goals): Arab collaboration led by the UAE, including Bahrain. **3. CO2sat payload project** • SDG 4 (Quality Education): Capacity building in satellite technology. • SDG 7 (Affordable and Clean Energy): Supports emission reduction strategies. • SDG 9 (Industry, Innovation, and Infrastructure): Advances in satellite design, integration, and operations. • SDG 13 (Climate Action): Indirectly supports climate science through gamma-ray detection (space weather research). • SDG 17 (Partnerships for the Goals): UK-Bahraini collaboration. **4. AI-Rideshare project** • SDG 9 (Industry, Innovation, and Infrastructure): Develops AI for space-based data processing. • SDG 17 (Partnerships for the Goals): Cross-border collaboration (e.g., Bahrain, Oman, China). **5. Aman payload project** • SDG 9 (Industry, Innovation, and Infrastructure): Secures satellite infrastructure via encryption. • SDG 16 (Peace, Justice, and Strong Institutions): Enhances data governance and security. • SDG 17 (Partnerships for the Goals): Cross-border collaboration (Bahrain Space Agency, UNOOSA, MBRSC). **6. LunaHCAM payload project** • SDG 9 (Industry, Innovation, and Infrastructure): Secures satellite infrastructure via encryption. • SDG 13 (Climate Action): Potential indirect benefits from lunar research (e.g., material science for sustainability). • SDG 17 (Partnerships for the Goals): Bahrain Space Agency, EgSA collaboration for ChangE7 Chinese lunar orbiter

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Space/ Satellite solution:	**1. Light 1 Satellite Project (Role of Space):** • Provides a platform to detect gamma rays from space, enabling observations unhindered by Earth's atmosphere. • Serves as a training tool for Emirati-Bahraini teams to master satellite design, launch, and operations in the space environment. • Advances scientific understanding of cosmic phenomena (e.g., solar flares, gamma-ray bursts) through orbital data collection. **2. Arab 813 Satellite Project (Role of Space):** • Delivers Earth observation (EO) capabilities to monitor climate, environment, and natural resources across Arab nations. • Enables large-scale tracking of deforestation, urbanization, and coastal changes, which are critical for regional climate action and policymaking. • Strengthens Arab collaboration by leveraging space as a shared resource for sustainable development. **3. CO2sat Payload Project (Role of Space):** • Uses satellite-based sensors to map greenhouse gas emissions (CO_2, methane) across Bahrain and the Gulf. • Overcomes limitations of ground-based monitoring by providing wide-area coverage and identifying emission "hotspots" (e.g., industrial zones). • Supports climate mitigation efforts by delivering transparent, actionable data aligned with global agreements like the Paris Accord. **4. AI-Rideshare Project (Role of Space):** • Integrates AI algorithms into satellites (e.g., StarVision, Omanlens) for real-time onboard data processing. • Reduces reliance on ground stations by enabling satellites to autonomously analyse images. • Optimizes bandwidth and energy use, making space missions more efficient and scalable. **5. Aman Payload Project (Role of Space):** • Secures satellite data transmission and storage through novel encryption algorithms, addressing vulnerabilities in space-based communication. • Protects sensitive earth observation imagery from cyber threats, ensuring data integrity for space applications. • Promotes trust in space infrastructure by advancing cybersecurity standards for global satellite networks. **6. LunaHCAM Payload Project (Role of Space):** • Utilizes a hyperspectral camera on the Moon (via China's Chang'E-7 orbiter) to identify surface materials like water ice and minerals. • Enables lunar resource mapping in shadowed regions, critical for future human missions and in-situ resource utilization (ISRU). • Strengthens international collaboration in deep-space exploration while advancing planetary science.

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Project impact	**1. Light 1 Satellite Project** • Capacity Building Impact: Establishes a skilled workforce in satellite development. • Scientific Impact: Enhances understanding of gamma-ray phenomena, contributing to space weather research and astrophysics. • Diplomatic Impact: Strengthens UAE-Bahrain ties, setting a precedent for future collaborative space missions. • Economic Impact: Lowers costs for future small satellite missions through proven 3U CubeSat technology. **2. Arab 813 Satellite Project** • Capacity Building Impact: Trains a group of Arab engineers, fostering self-reliance in satellite technology. • Geopolitical Impact: Unites Arab nations under a shared vision for space-driven sustainable development. • Environmental Impact: (Once launched) Provides critical hyperspectral data to combat desertification, manage water resources, and monitor climate change in Arab regions. • Policy Impact: (Once launched) Informs regional climate strategies and supports compliance with global agreements (e.g., the Paris Agreement). **3. CO2sat Payload Project** • Capacity Building Impact: Establishes a skilled workforce in payload design and development. • Innovation: Demonstrates cost-effective carbon monitoring tailored to arid environments. • Bilateral Impact: Strengthens UK-Bahrain partnerships in space tech and climate science. • Climate Action: (Once launched) Identifies GHG emission hotspots, enabling targeted mitigation in the Gulf's energy and industrial sectors. • Global Contribution: (Once launched) Aligns with UNFCCC transparency frameworks, aiding global carbon accounting. • Commercial Impact: (Once launched) Opens doors for GHG monitoring services. **4. AI-Rideshare Project** • Operational Efficiency: Reduces data transmission costs and latency. • Technological Impact: Positions Bahrain as a pioneer in AI-driven space applications. • Sustainability: Lowers energy use in satellite operations, aligning with green space initiatives. **5. Aman Payload** • Cybersecurity: Mitigates risks of data breaches in satellite systems, protecting sensitive infrastructure. • Trust Building: Encourages wider adoption of satellite data by governments and industries. • Global Standards: Influences international norms for secure space-based communications. • Diplomatic Impact: Reinforces UAE's role in UNOOSA-led initiatives for peaceful space utilization. **6. LunaHCAM Payload** • Lunar Science: Reveals new insights into the Moon's resource potential (e.g., water ice), aiding future exploration. • Technological Impact: Validates hyperspectral imaging for extreme environments, with applications for Mars or asteroids. • Global Collaboration: Strengthens Bahrain-Egypt-China partnerships in deep-space missions. • Economic Spin-offs: Supports lunar resource utilization strategies for space agencies and commercial entities.