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ADVANCING AUSTRALIA INDIA DEFENCE INDUSTRY COOPERATION

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The Australia India Institute is Australia's leading research and policy centre dedicated to enhancing Australia-India relations. In October 2026, the Institute hosted three Defence Industry experts from India to engage with a broad spectrum of industry, think tank, academic and policy professionals in Canberra, Sydney and Perth. These discussion papers were prepared in advance of this visit.

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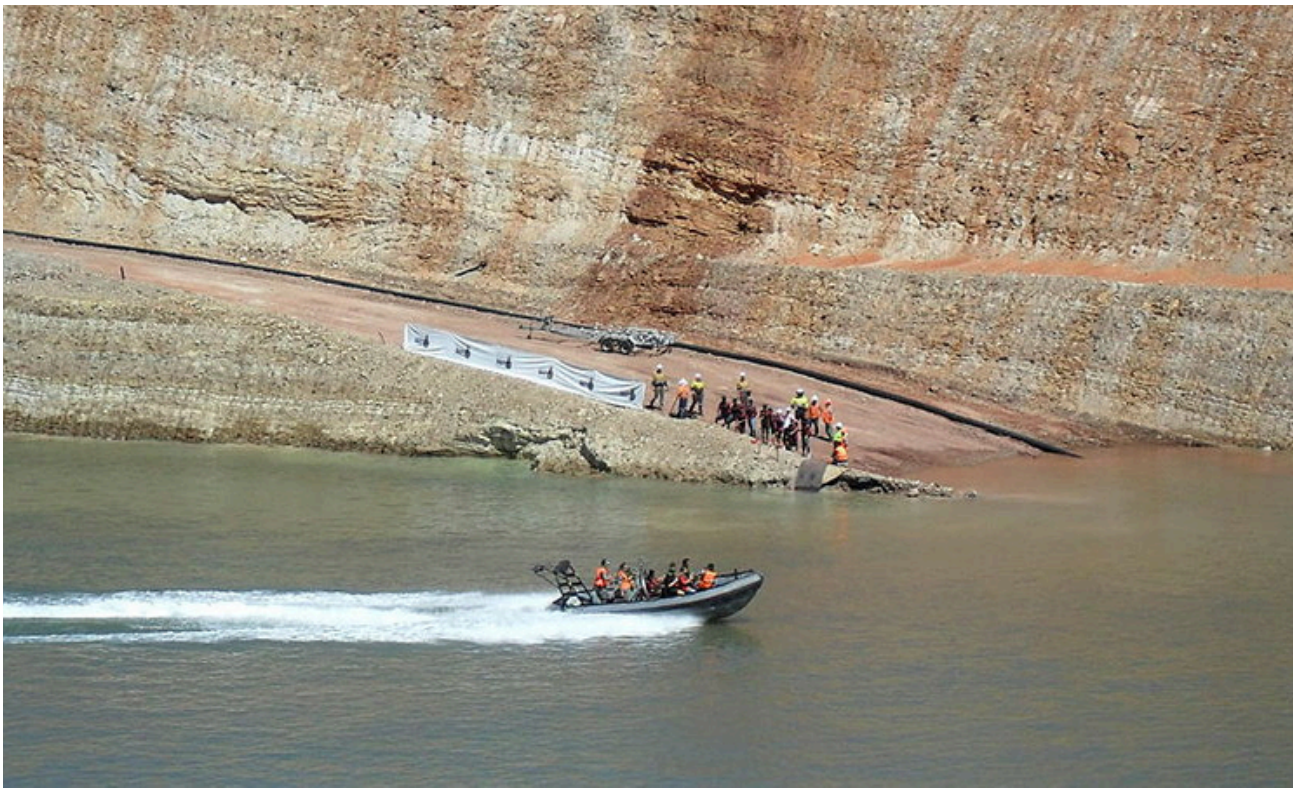

Beyond Mineral Security: Building an Australia-India Critical Minerals Partnership for Defence-Industrial Resilience

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POLICY PROBLEM

Australia and India have assembled the building blocks of a critical minerals partnership, but not yet the machinery that would make it matter in a defence-industrial crisis. A growing ecosystem of bilateral mechanisms, comprising the Australia-India Economic Cooperation and Trade Agreement (ECTA), the Critical Minerals Investment Partnership, the Critical Minerals Research Partnership, and the 2026 Partnership on Cyber, Critical Technologies and Supply Chains (PACTS), has opened channels for trade, investment, research, and technology cooperation.[1] However, these channels remain more adjacent than integrated.

The exposed flank is not ore availability alone, but the midstream and downstream capabilities that determine whether mineral endowment can be translated into usable strategic capacity. This includes critical value chain segments such as processing, separation, refining, advanced materials, permanent magnets, battery materials, recycling, logistics, and visibility across second and third suppliers.

Critical minerals sit inside semiconductors, sensors, batteries, high-performance alloys, permanent magnets, aerospace systems, and defence technologies.[2] Concentrated supply and export controls have consequently pushed them into the centre of economic-security policy.[3] The central question is whether Canberra and New Delhi can convert existing cooperation into commercially credible redundancy in the value-chain segments on which defence-industrial resilience depends.

ANALYSIS

Within such a partnership, Australia's contribution is anchored in geology, mining competence, mining equipment, technology and services, project development experience, and a processing base that is growing, albeit unevenly. Its Critical Minerals Strategy emphasises diversified supply chains and sovereign processing capability.[4] The Critical Minerals Strategic Reserve gives Canberra a more muscular instrument through offtake rights, demand aggregation, contracts for difference, and selective stockpiling, initially for antimony, gallium, and rare earths.[5] India, on the other hand, brings scale, engineering depth, manufacturing ambition, and durable demand.

Its National Critical Mineral Mission covers exploration, mining, beneficiation, processing, recovery from end-of-life products, processing parks, recycling, foreign asset acquisition, stockpiles, and research.[6] The bilateral opening, therefore, lies in joining these capacities without indulging the fiction that either country can quickly build a self-contained critical minerals system.

These complementarities create a compelling foundation for cooperation. However, they must still be translated into practical outcomes through proactive policy and commercial coordination. ECTA improves trade access and identifies Australian strengths in exploration technologies, mining software, processing components, environmental and mineral-quality technologies, and skills. The investment partnership selected five projects, two lithium and three cobalt, for detailed due diligence; the research partnership backed work across exploration, titanium-vanadium processing, rare-earth metallisation, and sustainable cathode production.[7] More recently, PACTS has given the agenda a wider strategic frame by placing critical minerals within supply-chain resilience and connecting advanced materials to defence research.[8]

Despite these advances, implementation has not caught up with strategic language. The 2026 summit statement called for investment, long-term supply and offtake arrangements, processing, and value-addition. Nonetheless, it did not create a mechanism that ranks value chains by defence relevance or translates demand into bankable projects.[9]

The International Energy Agency reports that refining concentration reached a record high in 2025 whereas investment in critical minerals fell by nine per cent, further underscoring the commercial difficulty of diversification.[10] Resilience must therefore be built where production would fail: through dependency mapping, viable alternative processing, credible offtake, recycling, and selective reserves for inputs whose disruption would interrupt priority production. Redundancy, in this context, should mean disciplined optionality, not duplication or indiscriminate stockpiling.

POLICY RECOMMENDATIONS

First, create an Australia-India Critical Minerals Supply-Chain Visibility Mechanism. The Australian Department of Industry, Science and Resources (DISR), the Department of Foreign Affairs and Trade (DFAT), Geoscience Australia, India's Ministry ofMines, the Ministry of External Affairs (MEA), the Geological Survey of India (GSI), and designated defence-industry representatives should initially map three value chains: rare earths to permanent magnets; lithium and cobalt to battery materials; and gallium and antimony to advanced electronics and defence materials. Its outputs should be a classified government annex, an aggregated industry dashboard, and a joint early-warning brief. Secure data rooms, aggregated reporting, and tiered access can protect commercial confidentiality without allowing it to veto collective situational awareness.

Second, establish a Defence-Industrial Critical Minerals Track under PACTS and the Joint Working Group on Defence Industry, Research, and Materiel. Defence ministries, India's Defence Research and Development Organisation (DRDO), Australia's Defence Science and Technology Group (DSTG), industry bodies, and prime contractors should identify a narrow set of minerals, materials, and components with direct defence relevance, then examine offtake, trusted-supplier, joint research and development, and limited stockpile options. The purpose is to make defence demand legible without converting the wider agenda into a security bureaucracy.

Third, co-invest selectively in processing, separation, and advanced materials. Australia should align Export Finance Australia, the Critical Minerals Facility, and the Strategic Reserve with Indian instruments under the National Critical Mineral Mission and Khanij Bidesh India Limited. Offtake backstops, demand aggregation,

concessional finance, and contracts for difference should be confined to projects that survive both strategic and commercial scrutiny. Public finance may reduce early-mover risk. That does not mean it should dignify weak projects with the language of resilience.

Fourth, recast the research partnership as a Technology and Recycling Platform. The platform should bring together Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO), India's Council of Scientific and Industrial Research (CSIR), the Indian Institutes of Technology, universities, the Australian Nuclear Science and Technology Organisation (ANSTO), Geoscience Australia, and industry. Their work should focus on rare-earth separation and metallisation, cathode materials, titanium-vanadium processing, magnet recycling, and battery recovery.

Particular emphasis should be placed on recycling and recovery, which can provide an additional source of flexibility without serving as a near-term substitute for primary supply.

CONCLUSION

If critical minerals are to become a genuine pillar of Australia-India defence-industrial resilience, the partnership must move beyond declaratory commitments towards mechanisms that create investable and operationally relevant supply chains. A working ecosystem linking Australian resources, processing know-how, and finance with Indian manufacturing scale, strategic demand, and industrial policy would expand strategic options without creating new dependencies. That is the standard against which bilateral progress should now be judged.

Closing the Gap: India-Australia Defence Innovation Cooperation

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On 9 July 2026, Indian Prime Minister Narendra Modi and his Australian counterpart Anthony Albanese signed the Joint Declaration on Defence and Security Cooperation (JDDSC).[1] They further released the Australia-India Partnership on Cyber, Critical Technologies and Supply Chains (PACTS), during PM Modi's official visit to Australia, marking a significant step in strengthening the India-Australia strategic and defence partnership.[2] Both instruments deepen their cooperation from exercises and maritime security, to defence-industry, innovation and research collaboration, building on the 2020 Defence Science and Technology Implementing Arrangement (DSTIA) between the Defence Science and Technology Group (DSTG) of Australia and the Indian Defence Research and Development Organisation (DRDO).[3]

India-Australia defence technology cooperation has evolved from identifying defence technologies, unmanned systems and niche technologies as priority areas in the inaugural 2+2 Ministerial Dialogue in 2021,[4] to exploring new defence S&T collaboration, such as sensor technologies, in the 2026 Defence Ministers' Dialogue.[5]

The two sides have also committed to deepening engagement through the annual ministerial dialogue and the Joint Working Group on Defence Industry, Research and Material, reinforced by the July 2026 Joint Declaration on Defence and Security Cooperation.[6] The key policy challenge, therefore, is to move beyond individual research projects towards a more integrated ecosystem linking government, industry and academia across experimentation, procurement and production. In this regard, the India-US INDUS-X model offers mechanisms that could be adapted to strengthen the India-Australia defence innovation and accelerate the development and deployment of advanced capabilities.

ECOSYSTEM CONVERGENCES

Both India and Australia have deepened their domestic defence-innovation ecosystems. Indigenisation drives, India's Aatmanirbhar Bharat and Australia's sovereign defence-industrial capability, have somewhat narrowed conventional arms trade, while opening the space for co-development, co-production, and joint R&D instead.

India's Innovations for Defence Excellence (iDEX), Technology Development Fund (TDF), Acing Development of Innovative Technologies (ADITI), and DRDO Industry-Academia Centres of Excellence (DIA-CoE) programmes have opened about a quarter of the defence R&D budget to industry and start-ups.[7] Australia's parallel effort runs through DSTG, Advanced Strategic Capabilities Accelerator's (ASCA), and the Australian Defence Science, Technology and Research Summit (ADSTAR) network, guided by its August 2026 Defence Innovation, Science and Technology Strategy, which prioritises hypersonic, lasers, autonomous systems, quantum, AI, and undersea warfare.[8]

Australia's expertise in sensors, undersea technologies, autonomy, quantum and cybersecurity complements India's strengths in manufacturing, AI, space and start-ups, creating opportunities for joint R&D, experimentation, capability development and production across these same domains.[9] The proposed Defence Articles and Services MoU, defence trade mission and bilateral Defence Industry Roundtable could provide institutional mechanisms for deepening these links.[10]

The first India-Australia joint defence science and technology project illustrates both the potential and limitations of bilateral defence R&D. In July 2025, DSTG's Information Sciences Division and the Indian DRDO's Naval Physical and Oceanographic Laboratory (NPOL) launched a three-year project on Towed Array Target Motion Analysis (TATMA).[11] It is aimed at improving detection and tracking of submarines and autonomous underwater vehicles capabilities through passive detection using hydrophone data, advanced signal processing, and AI/ML to detect, classify and track underwater targets without active sonar emissions.[12]

Beyond enhancing maritime situational awareness and interoperability, such technologies offer potential dual-use applications in oceanographic monitoring, seismic activity detection, illegal fishing and maritime pollution surveillance. The project therefore demonstrates the scope for India and Australia to pool expertise and resources in developing advanced undersea capabilities while supporting broader maritime security and resilience in the Indo-Pacific. This was supported by the Maritime Security Collaboration Roadmap and the PACTS defence-research pillar, while demonstrating that the two countries can undertake technically advanced defence research cooperatively.[13] The existing architecture enables dialogue, research and industry engagement but lacks an end-to-end pathway from R&D to testing, military adoption and production. Conversely, the India-US INDUS-X model offers a useful framework for translating strategic agreements into concrete defence innovation projects.

LESSONS FROM THE INDUS-X MODEL

Launched in June 2023 under the India-US Initiative on Critical and Emerging Technology (iCET), INDUS-X aims to create lasting institutional linkages across the defence innovation ecosystem.[14] It facilitates collaboration through joint challenges, start-up partnerships, academic engagement, industry matchmaking and access to testing facilities, while helping overcome regulatory and export-control constraints. Building on this model, the broader COMPACT (Catalyzing Opportunities for Military Partnership, Accelerated Commerce & Technology) framework, within which the TRUST (Transforming the Relationship Utilizing Strategic Technology) initiative broadens technology cooperation across defence and other critical emerging technologies.[15] The INDUS Innovation, modelled on INDUS-X was also launched to extend industry-academic partnerships into space and energy.[16] Other projects include procurement and co-production of Javelin anti-tank guided missiles and Stryker armoured vehicles co-production arrangements.[17]

India's iDEX and the US Office of the Secretary of Defense (OSD) lead the initiative for their respective governments, with the goal of using closer private-sector and research-institution ties to catalyse innovation within both defence industrial bases.[18] The collaboration agenda spans several tracks: a Senior Advisor Group overseeing progress and implementation, with support from USIP, USIBC, USISPF, and SIDM; industry and academia-led mentoring and accelerator programmes (H4x, ITIC, IIT Hyderabad); university partnerships (Penn State, IIT Madras, IIT Kanpur); and public-private initiatives.[19] It also includes joint prize challenges, reciprocal access to R&D centres and testing/certification labs such as the INDUSWERX,[20] an Indo-US Joint Innovation Fund for deep-tech start-ups, regulatory easing through Export Administration Regulations (EAR), International Traffic in Arms Regulations (ITAR), and standardised bilateral technology certification.[21]

The evolution of INDUS-X within the TRUST architecture illustrates how defence innovation can be embedded within a wider framework for strategic technology, industrial cooperation and supply-chain resilience. The absence of a comparable funded programme, unresolved export-control protocols, and the reliance on non-defence-specific research mechanisms, such as the Australia-India Strategic Research Fund (AISRF) and the MAITRI Fund, remain central barriers to deeper India–Australia defence innovation cooperation.[22]

POLICY RECOMMENDATIONS

- Establish a defence-specific joint innovation mechanism modelled on INDUS-X, led by DRDO and DSTG, with joint challenge identification, start-up matchmaking, accelerator programmes and measurable outcomes to create a repeatable innovation-to-capability pipeline.
- Create a jointly funded innovation seed fund and accelerator programme to support feasibility studies, prototyping, technology demonstrations and early-stage commercialisation, with priority given to projects addressing shared defence requirements.[23]
- Establish a scoped Bilateral Technology-Security Protocol framework under the existing defence science and technology architecture to create a renewable list of technology categories eligible for exchange, with priority given to undersea and maritime technologies. This would help identify technology categories that can be exchanged, co-developed and tested, while providing greater clarity on export controls, security classifications, verified technology vendor identifications and technology-transfer restrictions.[24]
- Create a Joint Testing and Technology-Transition Pipeline to link Indian and Australian R&D institutions, testing facilities and military users through a structured pathway. An INDUSWERX-style arrangement could create a passage from joint R&D and prototyping through testing, operational evaluation, procurement and co-production,[25] with the India-Australia towed-array project serving as an initial pilot.

CONCLUSION

India and Australia do not need another broad innovation dialogue, but rather need a mechanism that connects the institutions they already possess. The towed-array project provides an opportunity to test such a model. If its research outputs can be taken through joint experimentation, operational evaluation and procurement, the project could become the first building block of a repeatable India-Australia defence innovation-to-capability pipeline.

Accelerating India-Australia Defence Industrial Cooperation in Undersea Technologies

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In recent years, undersea warfare has emerged as a critical area of mutual concern for India and Australia. Collaboration in this domain is becoming increasingly important in light of the proliferation of submarines and UUVs in the Indo–Pacific. With rapid advancements in emerging technologies, both countries have increased investments in uncrewed underwater vehicles (UUVs), autonomous underwater vehicles (AUVs), and undersea surveillance technologies to enhance their undersea situational awareness in the region.

Some progress has already been made in advancing bilateral research and development (R&D) cooperation in undersea surveillance technologies. In July 2025, the Information Sciences Division of Australia's Defence Science and Technology Group (DSTG) and the Naval Physical and Oceanographic Laboratory (NPOL) under India's Defence Research and Development Organisation (DRDO) commenced a three-year collaborative research project to improve undersea surveillance technologies.[1]

Under this project, the two research organisations will collaborate on developing and evaluating Towed Array Target Motion Analysis algorithms to improve the early detection and tracking of submarines and AUVs.

The next step in bilateral defence industrial cooperation would be to move beyond R&D collaboration towards the co-development of prototypes, leading eventually to the co-production, procurement, and, possibly, export of deployment-ready platforms at scale.[2]

BUILDING ON EMERGING BILATERAL CAPACITIES AND CAPABILITIES

The development of the Ghost Shark XL-AUV by Anduril Australia, in collaboration with the Royal Australian Navy (RAN), from prototype to production in less than three years provides

a replicable model of accelerated capability development.[3] A candid and ongoing exchange of best practices between Australian and Indian interlocutors in this regard would help the latter identify the factors which aided the rapid capability development in the Australian case and could be implemented in the Indian defence industrial ecosystem. Additionally, Australia's Advanced Strategic Capabilities Accelerator (ASCA) uses challenge-based funding to move emerging technologies towards defence applications. For instance, in May 2026, under the ASCA Undersea Navigation Challenge, the Australian Department of Defence awarded contracts worth AUD 7.2 million to three Australian firms for the development of navigation technologies for AUVs operating in environments where GPS signals are unavailable.[4]

Meanwhile, India is developing indigenous AUVs through the Naval Science & Technological Laboratory (NSTL) of the DRDO and the Indian Navy, including man-portable AUVs for mine-countermeasure missions,[5] the High Endurance Autonomous Underwater Vehicle (HEAUV),[6] and the *Jalkapi* XL-AUV. These programmes demonstrate growing indigenous technical capacity and capability but are yet to progress to large-scale production and operational deployment.

BRIDGING THE R&D-TO-DEFENCE INDUSTRIAL COLLABORATION GAP

The opportunity, therefore, lies in combining Australia's experience in rapid innovation in niche underwater technologies with the opportunities offered by India's vast manufacturing scale and shipbuilding capacity to create a clear roadmap for progressing from government-led joint R&D to industry-led co-development of prototypes, testing, and, eventually, co-production at scale.

Under this roadmap, several practical mechanisms could be implemented to accelerate bilateral defence industrial and technological cooperation.

First, to support innovation, India's Innovation for Defence Excellence (iDEX) and Australia's ASCA, in partnership with selected defence users, could jointly identify niche yet operationally relevant problems — ranging from undersea sensing to autonomous mine countermeasures — and invite joint Australian-Indian proposals.

Second, a bilateral innovation fund could support selected bilateral projects after initial R&D to cover the costs of testing and demonstration. Third, selected projects could be given access to testing facilities and relevant platforms in both countries. Additionally, both governments should ensure access to legal support that would be required by joint teams to finalise terms related to intellectual property rights (IPR), licensing, technology transfer, data sovereignty, and export controls during the advanced stages of the projects. This would simultaneously provide legal clarity from an early stage and reduce delays between initial R&D and commercialisation of a technology. Finally, the jointly funded projects should have a pre-defined pathway to limited user trials, procurement, and licensed production or co-production.

On the Indian side, the DRDO already possesses mechanisms for transferring selected indigenously developed technologies to the Indian industry, providing one institutional model for translating innovation into defence industrialisation. Australia has also identified India as a top-tier defence and security partner, which provides a favourable basis for deeper cooperation in strategic undersea technologies, even though concerns pertaining to export controls and technology sovereignty would require extended negotiations.[7] Over the longer term, Australia could also explore whether limited Indian involvement in developing payloads and enabling systems for UUVs under AUKUS Pillar II would be feasible, considering India's growing defence ties with both the US and the UK.[8]

At the industry level, a partnership between India's Mahindra Group, which has an existing partnership with Anduril Industries to develop autonomous maritime systems, and Anduril Australia could be proposed and integrated into the roadmap.[9] In addition, Indian firms involved in the development of autonomous maritime systems and naval technologies, including Mazagon Dock Shipbuilders (MDL), Cochin Shipyard Limited (CSL), Larsen & Toubro (L&T) and Bharat Electronics Limited (BEL), could partner with Anduril Australia and Blue Ocean Marine Tech Systems to access advanced testing facilities and technologies in Australia.[10] There is also scope for Australian firms to invest in India's first autonomous maritime shipbuilding and systems centre being built by Sagar Defence Engineering at the Juvvaladine fishing harbour in Andhra Pradesh.[11] The Undersea Defence Technology (UDT) exhibition,

which will take place in Adelaide in December 2026, provides a valuable opportunity for Indian defence firms to engage with their Australian counterparts operating in the undersea technology sector. The Indian and Australian governments could consider enhancing the participation of Indian defence start-ups and smaller firms through funding support to facilitate greater interaction between the two industries.

TOWARDS A BILATERAL UNDERSEA TECHNOLOGY COLLABORATION ROADMAP

A roadmap for progressing from joint R&D to co-development and co-production involving the defence industries would require leveraging the iDEX and the ASCA platforms to define challenges in undersea warfare technologies, increasing investments in testing infrastructure and shipyards in India, developing a bilateral regulatory framework for co-development in sensitive technologies, clarifying procurement requirements, and facilitating regular interaction between the defence industries, especially for start-ups and smaller firms.

The towed-array project being undertaken by the DRDO and DSTG presents a timely opportunity to progress from joint R&D to advanced defence industrial cooperation in AUVs, sensing, and other undersea technologies.

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