

SPARK: A National Framework to Catalyse Industry-Led R&D and Product Design-Led Growth in India

FAST-India convened a CXO Roundtable on “*Catalyzing R&D in Industry: Learnings and Way Forward*”, bringing together eminent leaders from industry. This note synthesizes the key insights, strategic recommendations, and forward-looking ideas that emerged from those deliberations.

If India wants to become a \$30-trillion economy, per-capita income will need to rise from around \$2,500 to about \$18,000. The only sustainable way to do that is by owning the IP behind the technologies and products the world uses, not just consuming them.

The deliberations focused on the urgent need to raise India’s industrial R&D intensity through strategic direction, institutional reform, and public–private co-investment. A shared understanding emerged that *deep tech demands deep science*, industrial R&D cannot scale without parallel strengthening of scientific and institutional capacity. India needs a balanced mix of incentives and accountability to make private firms invest more seriously in R&D. Rather than depending solely on regulation or appeals, the idea is to combine inducements with mechanisms that ensure discipline and measurable results.

FAST synthesized the recommendations from industry into a SPARK Framework—a five-pillar strategy to transform India into a global innovation and design hub. It emphasises on the following:

- Strategy & Mission Focus (S) to identify long-term national technology missions;
- Procurement & Market Creation (P) to generate predictable demand through advance commitments and innovation-friendly public procurement;
- Access to Finance (A) to mobilise blended capital and reward design-led R&D;
- Research Translation & Institutional Reform (R) to bridge the gap between laboratory research and market deployment;
- Knowledge Product Ecosystem to build a risk-tolerant, globally competitive innovation ecosystem.

FAST India will continue its deliberations through a newly constituted *Industry R&D Leaders Council*. This document should be treated as a living Working Paper, to be periodically updated and expanded with new annexures as discussions progress.

S: Strategy & Mission Focus

To position India as a global innovation and design hub, a clear national direction must guide industrial R&D. Without mission focus, public and private R&D investments risk fragmentation and short-termism. Deeptech innovation needs long-term continuity, institutional capacity, and national coherence.

Deeptech needs deep science. Institutional capacity has to go hand-in-hand with industry participation so that absorption power improves and cutting-edge research can be translated into market-ready technology.

Recommendations:

- **Government should identify and notify 10–15 national technology missions** aligned with strategic autonomy and export competitiveness in areas such as electronics, semiconductors, materials, quantum, biotech, and clean energy.
- **Break each mission into system–module–component layers** to guide industry participation, supply chain localisation, and modular co-development together with deeptech startups.
- **Maintain mission continuity for 5–10 years** to ensure cumulative learning, technology maturation, and investment certainty.
- **Encourage parallel policy experiments** across regional technology clusters (Hyderabad, Pune, Bengaluru, Navi Mumbai, Chennai, NCR) to identify scalable models for collaboration, co-funding, and co-development between government, academia, and industry.
- Establish thematic incubators with shared hard infrastructure (cleanrooms, testing labs, simulation facilities) and adequate capitalization to support early-stage deeptech ventures within these missions.

P: Procurement & Market Creation

To stimulate private R&D, India must create predictable, aggregated demand and make procurement innovation-friendly. Innovation will not scale without markets. Demand certainty and procurement flexibility are essential to shift firms from assembling imported technologies to designing indigenous ones.

Recommendations:

- **Establish Advance Market Commitments (AMCs) and minimum order guarantees** in priority sectors to de-risk private sector investment in R&D and manufacturing.
- **Institutionalise “Designed in India”** as both a procurement and branding category—prioritising indigenous design over mere assembly.

- **Permit single-vendor procurement** for novel or strategic technologies under an expanded **IDDM (Indigenously Designed, Developed and Manufactured)** framework with appropriate safeguards.
- **Aggregate government demand across ministries, PSUs and state government for mission-linked products.**
- **Reform procurement processes** to accommodate startups and SMEs through **milestone-based payments, reduced bid security, simplified tendering, and outcome-based evaluation criteria.**
- **Introduce time-bound protections for domestic vendors in strategic sectors while negotiating FTAs,** ensuring that procurement liberalisation does not prematurely expose nascent Indian industries to global competition.
- **Encourage flagship design-led exports (e.g., next-generation consumer electronics such as smart glasses, AR/VR devices, and wearables)** to showcase “Design in India” capability and position Indian industry in emerging global value chains.

A: Access to Finance & Innovation Capital

A restructured financial architecture is needed to fund high-risk, high-reward industrial R&D. Traditional systems are risk-averse and ill-suited for long-gestation deeptech projects. Blended finance and smart incentives can crowd in private capital without compromising fiscal prudence.

Recommendations:

- **Operationalise the national R&D and innovation fund** through **blended finance mechanisms**, a mix of grants, concessional loans, impact bonds and equity, linked to measurable milestones.
- **Executing well the dedicated Deep-Tech Fund-of-Funds** to attract specialist venture capital and patient private investors focused on deep technology domains.
- **Augment incentive schemes (e.g., PLI-type)** to reward **design IP, prototype completion, and first-in-market deployments**, rather than only production volume or assembly value.
- **Introduce a Research-Linked Incentive (RLI)** scheme to reward firms that invest in indigenous innovation, much like PLI did for manufacturing.
- **Reintroduce targeted tax instruments for innovation-linked revenue and verified external R&D expenditure**, incentivising firms to invest in research partnerships.

R: Research Translation & Institutional Reform

India’s innovation bottleneck lies in translation, turning research into usable technology and economic value. India produces significant research but struggles to convert it into products, patents, or firms. Institutional rigidities, weak incentives, and poor industry linkages block this pipeline.

The capacity to absorb and apply scientific knowledge is as critical as the capacity to produce it. India’s institutions must evolve from research producers to innovation enablers.

Recommendations:

- **Establish Focused Research Organisations (FROs)** pairing leading research institutions with industry partners to co-develop mission technologies under outcome-based funding. These FROs could also be an avenue to attract the best talent which has pursued PhDs from top 100 STEM institutions.
- **Convert under-utilised public R&D infrastructure into open-access or GOCO (Government-Owned, Company-Operated) models**, allowing industry and startups time-share use of laboratories, testing facilities, and instrumentation.
- **Expand Section 8 translational hubs** within universities and research institutions to allow flexible contracting, IP sharing, and startup incubation.
- **Integrate translational metrics**—such as **patents licensed, technologies commercialised, and startups incubated**—into institutional performance evaluation frameworks.
- **Reclassify higher education institutions** into **Education (E)**, **Education + Research (ER)**, and **Education + Research + Innovation (ERI)** categories, aligning funding and expectations with mission orientation.
- **Reform faculty appraisal systems** to value **translational outcomes, industry partnerships, spin-offs, and applied research income** alongside publications.

K: Knowledge Product Ecosystem

A competitive innovation system rests on clear metrics, capable talent, and clustered knowledge ecosystems. India must reward experimentation, not compliance. Innovation depends on the continuous circulation of talent, ideas, and trust. Flexible governance and risk-tolerant financing must replace procedural rigidity to let experimentation thrive.

Recommendations:

- **Measure What Matters:** Standardise corporate reporting on R&D intensity and innovation output by listed companies to benchmark national performance. Public reporting should include the proportion **of turnover from products introduced in the past five years**. Evaluate CEOs and boards on new-product revenue, external R&D spending, and collaboration outcomes to make innovation a board-level KPI.
- **Cluster and Cultivate Talent:** Develop regional knowledge clusters that co-locate universities, research labs, startups, and industry, sharing infrastructure, data, and governance platforms. Launch Industry Co-Chair Programs to attract world-class researchers to work on industry-centric problems, and expand R&D exposure through shared facilities.
- **Enable Risk and Flexibility:** Enact a Charter for Ease of Doing Research to simplify approvals and IP-sharing norms. Institutionalise risk tolerance and process-based audits and enable milestone-linked funding.

Building a Shared Narrative

- Move decisively from a **“Make in India”** to a **“Design and Make in India”** paradigm, anchored in ownership of IP, frontier technology leadership, and exportable innovation.
- **Create an Industry R&D Coalition** to sustain advocacy for procurement reform, blended finance, and innovation incentives.
- **Institutionalise biannual review dialogues** between government, industry, and academia to assess progress, identify policy bottlenecks, and recalibrate interventions.