

Financing Hard-to-Abate Sector Decarbonization

TERI Expert Group

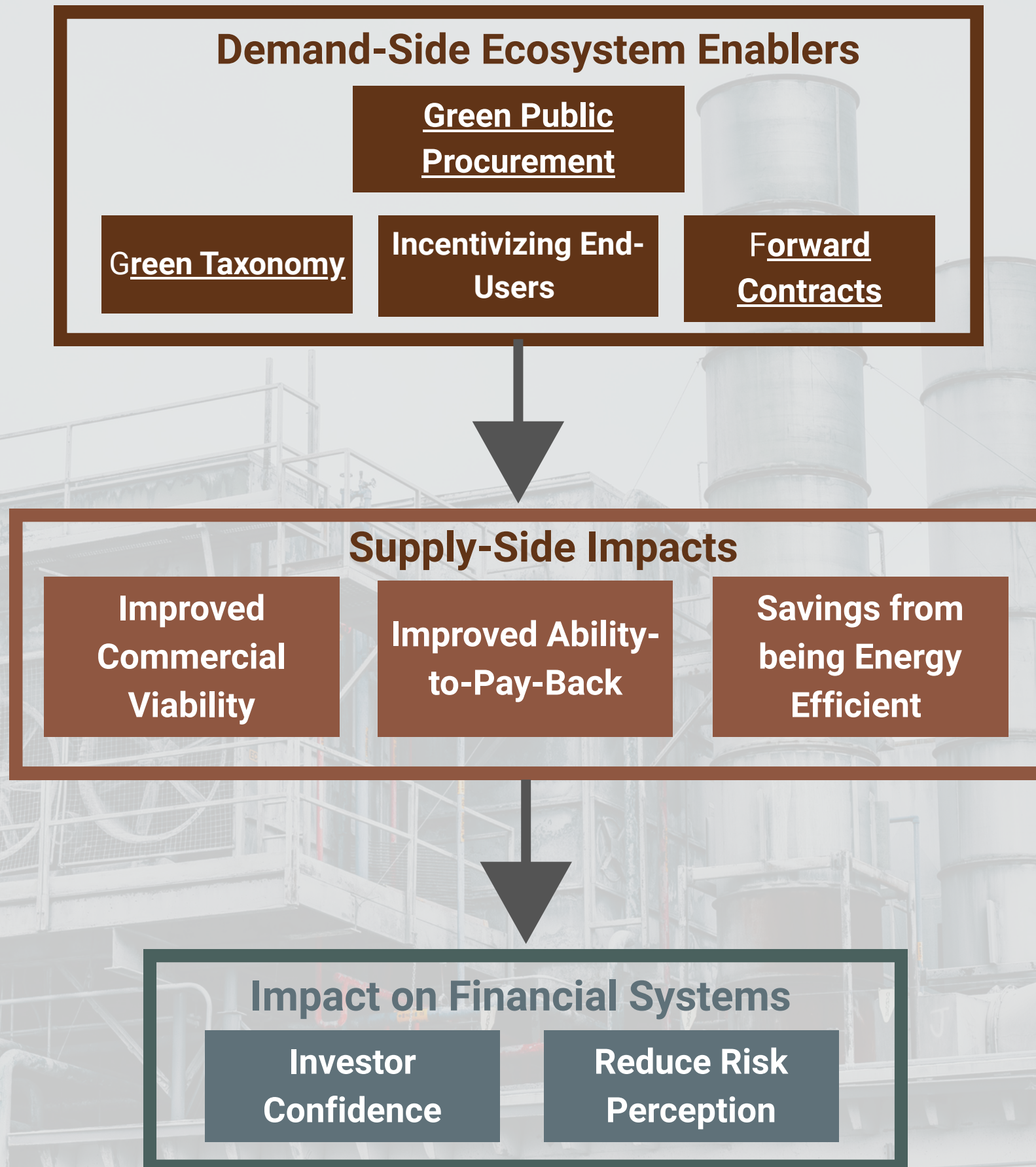
on

Financing India's Long Term Low-Carbon
Strategies (LT-LCDS)

30th June, 2025.



Call to Action #1: Leverage Regulatory Instruments to Stimulate Market Demand for Green Taxonomy



Recommendations

1. **Establish a green taxonomy** – Standardized definitions for 'green' processes and products will reduce uncertainty, boost investor confidence, and reduce risk perception.
2. **Implement green public procurement** – Government commitments to purchase green products will create guaranteed demand, improve commercial viability, and signal market leadership.
3. **Promote forward contracts** – Secured future revenue streams will enhance the ability to pay back loans, improve creditworthiness, and attract lenders.
4. **Incentivize end-users** – Tax rebates, GST exemptions, and awareness campaigns can drive adoption of green technologies, leveraging savings from energy efficiency and improving demand.
5. **Strengthen financial ecosystems** – Supportive regulatory frameworks will lower financing costs, improve investor confidence, and reduce risks in hard-to-abate sectors like steel and cement.

Key Barriers to Address

1. **Scale of capital required and the cost of capital** – High upfront investments and expensive financing deter decarbonization in hard-to-abate sectors.
2. **Imbalance in risk and return** – Uncertain profitability and high risks discourage private investment.
3. **Technological uncertainty** – Unproven or emerging low-carbon technologies face adoption hesitancy; A lack of standardized definitions and guidelines (e.g., green taxonomy) creates ambiguity around emerging low-carbon solutions.
4. **Lack of commercial viability and high transaction costs** – Weak demand and complex financing raise barriers

Call to Action #2: Operationalize a Dedicated Fund to Support Technology Upgradation

Potential Sources of Finance

Development
Assistance Aid

MDB Credit Lines

Government Grants

International
Tech Funds

First loss Capital from
MDBs

Venture Capital

For an Established list of
BATs

Dedicated
Technological
Upgradation Fund

credit
subsidization
or partial risk
coverage or VGF

Lowered Cost of
Capital

Lowered Risk
Perception

increased flow
of finance
promotion of capital
investments

Industry

Recommendations

- 1. Establish a Dedicated Technology Upgradation Fund** - Create a financial corpus to subsidize interest rates on loans for adopting (Best Available Technologies) BATs, incentivizing industries, especially MSMEs, to invest in upgrades. Leverage lessons from India's successful TUFS (Technology Upgradation Fund Scheme) scheme in textiles to structure support for hard-to-abate sectors.
- 2. Provide Credit Subsidization & Partial Risk Coverage** - Offer partial interest payment coverage and VGF (Viability Gap Funding) to improve risk perception among lenders.
- 3. Leverage Development Assistance & International Tech Funds** - Mobilize development assistance aid, MDB credit lines, and international tech funds to scale up proven technologies. Secure first-loss capital from MDBs to attract private venture capital.
- 4. Facilitate Government Grants & Industry Partnerships** - Combine government grants with industry contributions to promote capital investments in energy-efficient technologies.

Key Barriers to Address

- 1. Varied needs of sectors** – Hard-to-abate industries have diverse technological requirements, demanding flexible, sector-specific financing solutions.
- 2. High transaction costs** – Upfront capital and bureaucratic hurdles deter industries from adopting BATs, slowing transition.
- 3. Awareness gaps** – Limited knowledge about viable transition pathways and BAT benefits hinders uptake despite available finance.
- 4. Imbalance in risk and return** – High perceived risk and long return periods discourage private investment in energy-efficient technologies.

Call to Action #3: Leverage Blended Finance to De-risk Investments in Green Technologies

Suitable Blending of Public, Private & Philanthropic Sources

Development
Assistance Aid

MDB Credit Lines

Multi-tiered Equity
Funds

International
Tech Funds

First loss Capital from
MDBs

Venture Capital

Low Carbon
Investment Trusts

Public Grants

Dedicated Blended Fund

Lowered Cost of Capital

Increased Scale of
Capital

Market Development of
Technologies

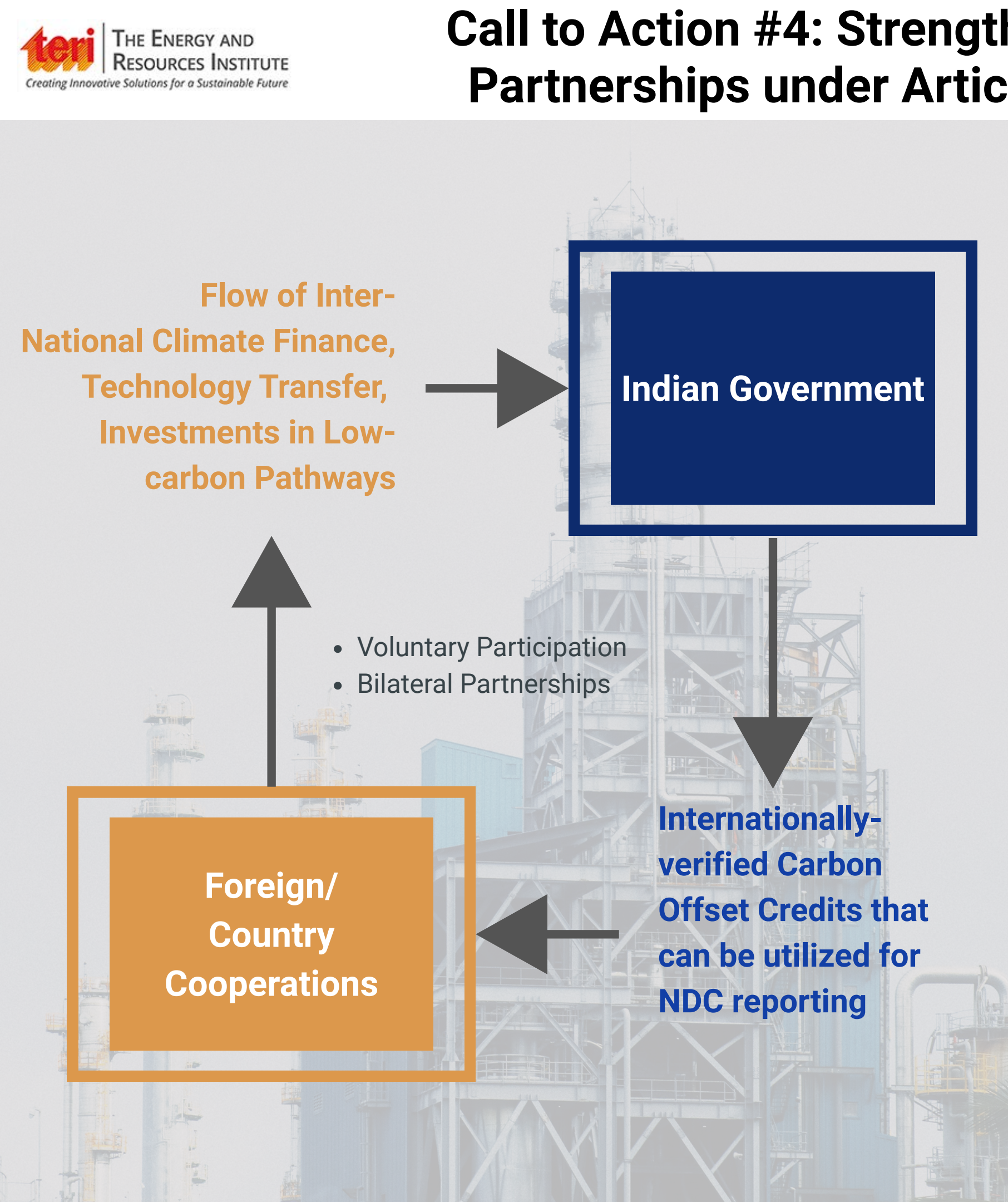
Risk Coverage for
Adoption

Recommendations

- Leverage Blended Finance for Hard-to-Abate Sectors** - Combine concessional public funds (development assistance aid, MDB credit lines) with private capital for advancement and scaling of technologically proven but commercially unviable projects, such as green hydrogen, CCUS and new upcoming technologies
- Establish a Dedicated Fund with De-Risking Instruments** - Create a blended finance-supported dedicated fund using first-loss capital from MDBs, subordinate debt, and green bonds to attract venture capital, and provide risk coverage for adoption.
- Expand Financial Instruments for Market Development** - Utilize multitiered equity funds, low-carbon investment trusts, and public grants to foster development of emerging transition technologies.
- Enhance International Climate Finance Mechanisms** - Leverage international tech funds to incubate new ideas through capacity-building efforts.
- Build Institutional Capacity & Regulatory Frameworks** - Address knowledge gaps by creating an enabling regulatory environment for market development of technologies.

Key Barriers to Address

- Cost of Capital** - High capital costs deter private investment in hard-to-abate sectors, making blended finance essential to lower financing barriers.
- Lack of Commercial Viability & Transaction Costs** - Proven transition technologies (e.g., green hydrogen, CCUS) remain commercially unviable.
- Imbalance in Risk and Return** - Investors shy away from large-scale transition projects due to disproportionate risks and returns.



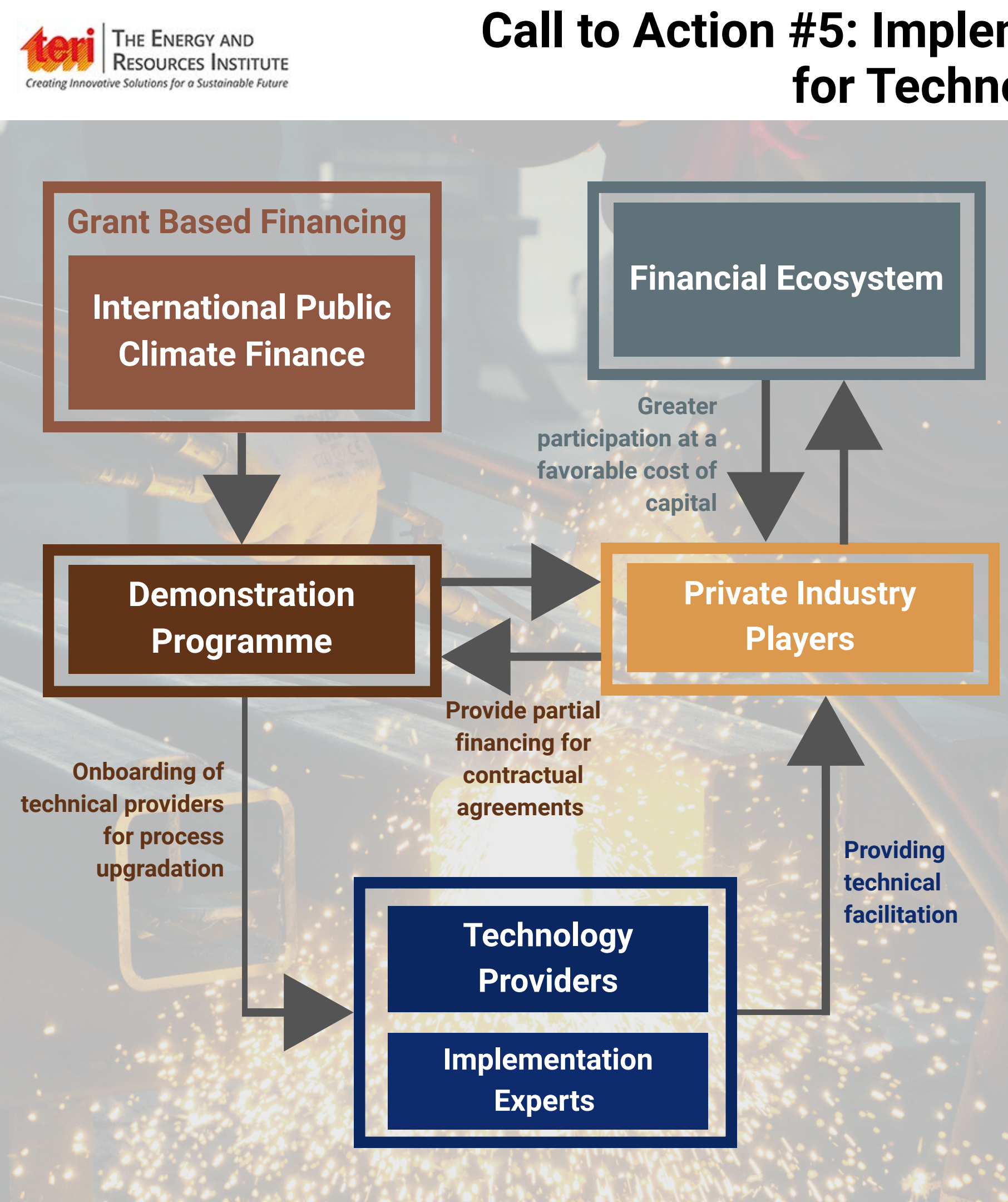
Call to Action #4: Strengthen Bilateral and Multilateral Partnerships under Article 6 of the Paris Agreement

Recommendations

1. **Leverage Article 6 of the Paris Agreement** - The Indian government should actively pursue bilateral partnerships under Article 6 to generate internationally verified carbon offset credits from emission reduction projects in hard-to-abate sectors. These credits can attract flow of international climate finance while helping other nations meet their NDCs.
2. **Encourage Voluntary Participation & Investment** - Promote voluntary participation of industries to mobilize foreign investments in low-carbon pathways, ensuring technology transfer and advanced best practices for cost-effective decarbonization.
3. **Strengthen Foreign Cooperations** – Model partnerships like the JCM (Joint Crediting Mechanism) to facilitate foreign/country cooperations.

Key Barriers to Address

1. **Imbalance in Risk and Return** - Hard-to-abate sectors often face high upfront risks (e.g., unproven business models) with delayed returns, deterring private investors.
2. **Technological Uncertainty** - Transition technologies (e.g., green hydrogen) lack scalability or cost competitiveness in India.
3. **Scale of Capital Required & Cost of Capital** - Energy transition demands massive capital at low rates, which Indian industries struggle to secure.



Call to Action #5: Implement Demonstration Programmes for Technologies and Models

Recommendations

- 1. Leverage International Public Climate Finance** - Deploy international public climate finance to support demonstration programmes for low-carbon technologies (e.g., hydrogen blending, CCS) in hard-to-abate sectors,
- 2. Establish a Publicly Backed Demonstration Programme** - Operationalize a domestic demonstration programme, partially financed by international climate finance, to de-risk adoption for private players through measures like risk coverage or co-funding.
- 3. Enhance Private Sector Participation at Favorable Cost of Capital** - Provide risk coverage through public finance to enable private players to raise commercial and capital market financing.
- 4. Engage Technology Providers & Implementation Experts** - Integrate technology providers and implementation experts into public-private partnerships to maximize the effectiveness of decarbonization projects.
- 5. Learn from Global Model** - Replicate successful models like the Dutch ARAMIS Project, where government funding (e.g., SDE++ scheme) collaborated with private firms (Shell, Total Energies) to scale CCS deployment.

Key Barriers to Address

- 1. Imbalance in Risk and Return** – High risks deter private investment despite long-term decarbonization benefits.
- 2. Technological Uncertainty** – Unproven or evolving technologies increase adoption risks for first movers.
- 3. Scale of Capital Required & High Cost of Capital** – Large upfront investments and expensive financing hinder deployment.
- 4. Lack of Commercial Viability & High Transaction Costs** – Low profitability and complex processes slow market uptake.