15 Blended Capital Market Mechanisms for Critical Decarbonisation Projects in India

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15.1 Context

This chapter focuses on two critical sectors that demand urgent decarbonisation efforts – India's coal-fired power plants, which dominate the electricity generation mix, and its vast landscape of micro, small, and medium enterprises (MSMEs), which contribute substantially to the nation's Gross Domestic Product (GDP) and exports. Repurposing existing coal-fired power plants into renewable energy facilities presents substantial economic opportunities, with studies demonstrating the potential for significant financial gains compared to early retirement costs. Similarly, facilitating affordable financing for MSMEs to adopt low-carbon technologies is pivotal, given their significant contribution to the energy consumption of large industries. This chapter proposes two innovative financing mechanisms to drive investment from the rapidly growing sustainable debt capital market by leveraging public capital that can address these challenges. These mechanisms are:

1. **Sustainability-linked green bonds (SLGBs)**: This can help private coal power producers by aligning financial incentives with sustainability targets, such as coal plant decommissioning and renewable energy capacity additions. These bonds would fund repurposing projects, attracting environmentally conscious investors while ensuring the funds flow towards facilitating the transition. By tapping into the sustainable debt market and leveraging public capital, SLGBs can unlock financing for these critical projects.
2. **A government-backed green finance platform for MSMEs**: Such a platform will enable MSMEs to access debt from capital markets for investing in low-carbon technologies. It would adhere to international standards for green bonds and loans, fostering investor confidence and unlocking long-term financing at reasonable rates for MSMEs. This platform can provide much-needed funding for MSMEs' decarbonisation efforts by leveraging public capital and the growing sustainable debt market.

These tailored mechanisms aim to mitigate barriers, unlock funding for climate-friendly projects and harness diverse capital sources, including public finance, private debt and the burgeoning sustainable debt capital market. Using SLGBs to Repurpose India's Coal-fired Power Plants

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15.2 Economic Case for Repurposing Coal-fired Power Plants

Achieving emission reduction goals necessitates the early retirement of coal-fired power plants. However, the timing and pace of these retirements have become a contentious issue among policymakers, plant owners, financiers, and other stakeholders (Varadhan, 2023).

One potential solution that has gained traction globally is the repurposing existing coal-fired power plants into renewable energy facilities. This approach not only mitigates the environmental impact of coal-fired generation but also leverages existing infrastructure, reducing the capital costs and land acquisition challenges associated with greenfield renewable energy projects while offering a relatively smoother just transition. This approach ensures that a rapidly growing country like India can meet its emissions reduction targets without compromising energy security.

Repurposing coal plants can offer substantial economic benefits. According to a study by Climate Risk Horizon, converting coal-fired power plants in Maharashtra could yield financial benefits 2–4 times greater than the costs of early retirement (Shrimali, 2022). Further, it would also help the state's electricity distribution company save around USD 9.08 billion (INR 750 billion) over a decade because of cheaper renewable energy costs. The savings from repurposing could cover 30–170% of the new capital expenses required for converting the coal plants into renewable energy facilities, benefiting both coal power producers and energy off-takers while aligning with India's climate objectives.

Another study (Jindal and Shrimali, 2022) evaluates the economic rationale for repurposing a representative 1,000 megawatts (MW) coal-fired power plant in India for solar energy, battery storage and synchronous condensers. The study develops a detailed cost-benefit framework to show a strong economic case for repurposing over decommissioning. Significantly, the present value of benefits from repurposing (USD 590.82 million/INR 49.4 billion) far exceeds the total decommissioning costs (USD 103.91 million/INR 8.7 billion). Even excluding social benefits, the net economic benefits covered 10–32% of the required capital expenditure, demonstrating financial viability. The study estimates that, in India, decommissioning costs are nearly half (USD 58 million/INR 4.8 billion) that of plants in the U.S. (USD 117 million/INR 9.8 billion), which is another economic benefit. It also provides a practical methodology for identifying and prioritising plants suitable for repurposing. Factors like age, energy charges, and other qualitative criteria form the basis of the methodology. Overall, the substantial net positive economic value, coupled with relatively lower decommissioning costs, form a compelling argument for repurposing India's coal-fired power plants as the country transitions from fossil fuels.

A recent study finds that renewables can potentially profitably replace around 800 coal-fired power plants in emerging economies (Jacobson, 2024). The five coal-to-clean transition opportunities assessed in the study are economically viable within the next five years without subsidies, allowing private capital and utilities to finance these deals profitably. Some coal-fired power plants may need partial philanthropic support or risk mitigation to demonstrate feasibility. But, generally, the economics of repurposing favours proactive sourcing and financing of such projects by private investors and utilities, with positive estimated returns exceeding the weighted average cost of capital.

15.2.1 A Case for Capital Market-Based Solutions for Repurposing Indian Coal-fired Power Plants

In India, the initiative for repurposing will likely have to come from the private sector. The government hesitates to retire coal assets prematurely due to energy security concerns (Varadhan, 2023). However, private-sector coal-based power producers can pursue

early retirement and repurposing. Companies like Tata Power, Adani Power, and JSW Energy have committed to decarbonisation and have strong balance sheets. They can leverage capital market-based solutions to finance repurposing projects of technically feasible coal-fired power plants.

These companies account for a significant portion of India's coal-fired power generation capacity. According to the Central Electricity Authority, as of June 2024, private companies owned approximately 35% or 73.5GW of India's coal-based capacity (CEA, 2024). Targeting these privately owned assets for repurposing could be a starting point.

Next, we propose and discuss a market-based mechanism that companies can use for repurposing projects. Companies with access to debt capital markets have more leeway to retire coal plants earlier. Even state-owned companies like NTPC can easily use the proposed structure if the government formulates a clear policy around repurposing and early retirement of coal-fired power plants.

15.2.2 SLGBs: A Financing Solution for Repurposing Coal Power Plants

One potential financing solution for Indian coal-fired power producers is issuing sustainability-linked green bonds (SLGBs). This innovative financial instrument combines the features of traditional green bonds, whose issuers can only use the proceeds to finance environmentally friendly projects, with sustainability-linked bonds (SLBs), which incentivise the achievement of predetermined sustainability targets at a corporate level.[1]

Key Performance Indicators (KPIs) related to the issuer's environmental, social and governance (ESG) targets form the pillars of the structure of a vanilla SLB. Issuers face penalties if they fail to meet these KPI targets. On the other hand, meeting the KPIs can bring down subsequent coupon payments.

The global SLB market stands at USD 297 billion as of 31 May 2024, with the first issuance as recently as 2019. However, greenwashing concerns have emerged as the proceeds of vanilla SLBs can end up funding non-green projects. We propose an SLGB structure to overcome this hurdle, which links KPIs and proceeds to specified projects.

Under this proposal, a coal-fired power generator would issue an SLGB with the following three KPIs:

1. Decommission coal-fired power plants with an ambitious target date.
2. Integrate renewable energy generation capacity or other zero-carbon assets and infrastructure projects, either before or simultaneously, with the decommissioning of coal-fired power plants.
3. Reskill, rehire and offer compensation packages to displaced manpower to ensure a just transition from coal to a renewable energy plant.

Beyond the KPIs, the issuer must also ring-fence the SLGB proceeds to specified projects that would fulfil each KPI to ensure the issuance's transparency and prevent funds' misuse.

The SLGB structure offers several benefits. It aligns the financial incentives of the issuer with India's climate goals by linking the bond's performance to measurable sustainability targets. It also ensures the funds raised flow to projects that facilitate the transition to renewable energy while supporting a just transition for affected workers and communities.

Furthermore, SLGBs can help attract a broader investor base, including environmentally conscious investors seeking sustainable investment opportunities. This increased

demand for SLGBs could lower the cost of borrowing for issuers, further enhancing the economic viability of repurposing projects.

15.2.2.1 Blending SLGBs with Public Capital and Carbon Credits

A lower cost of borrowing would be crucial to motivate coal-fired power generators to repurpose their plants early. We discuss a few ways to further enhance the economic viability of SLGBs, as illustrated in Figure 15.1.

15.2.2.1.1 DUAL-TRANCHE ISSUANCE AND CONCESSIONAL FINANCING

A potential avenue could be a dual-tranche issuance, where the senior tranche targets institutional investors, while the secondary tranche presents an opportunity at a preferential rate for multilateral development banks (MDBs). This concessional funding could

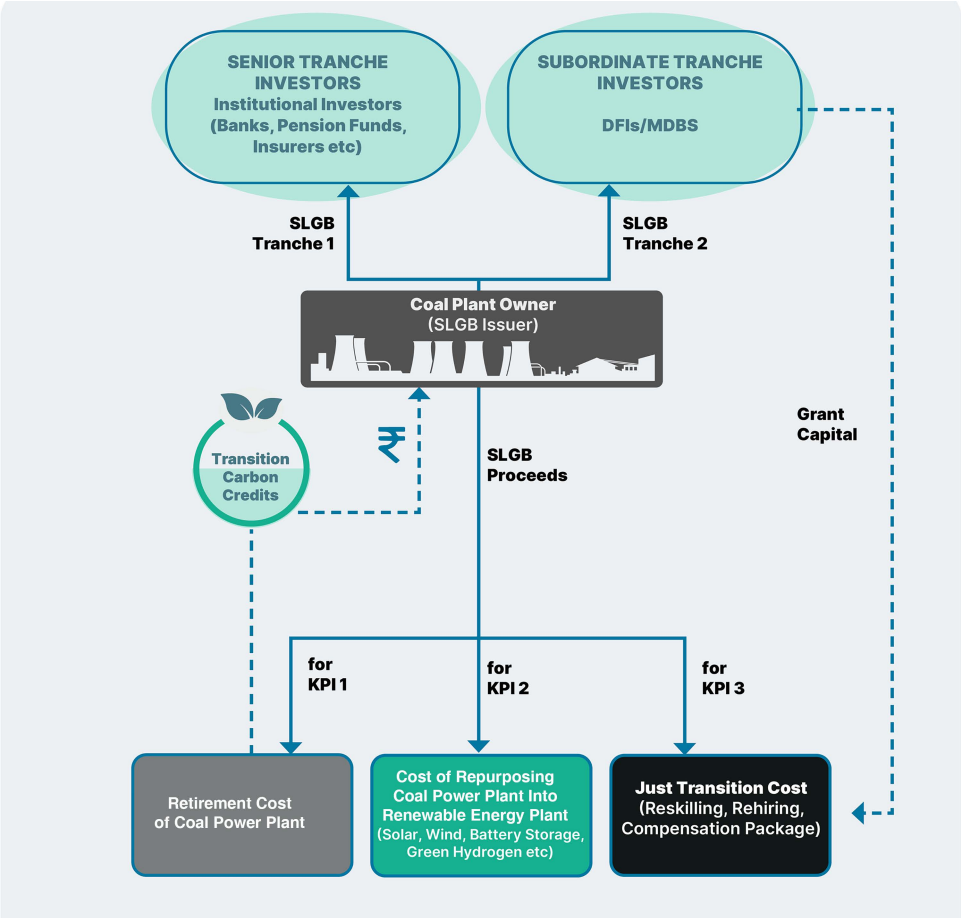

Figure 15.1 A Blended SLGB Mechanism for CFPP Repurposing

Source: Authors

lower the overall borrowing cost, making early coal plant repurposing more attractive for utility companies.

Alternatively, credit guarantees provided by MDBs and development finance institutions (DFIs) could lower the risk profile of SLGBs, thus reducing the cost of borrowing. MDBs and DFIs can also offer grants to fund workforce reskilling programmes, transaction costs and ongoing monitoring and verification expenses required for credible SLGB issuances.

MDBs like the Asian Development Bank (ADB) are already involved in early coal retirement through blended finance mechanisms like the Energy Transition Mechanism (ETM) in other countries such as Indonesia, Vietnam, Philippines, Pakistan and Kazakhstan (ADB, 2023). The proposed tranche or guarantee mechanism would allow them to expand ETM in India.

15.2.2.1.2 CARBON CREDITS FOR DEBT SERVICING

We propose creating a high-integrity 'transition credits' mechanism, as suggested in a working paper by the Monetary Authority of Singapore (MAS) and McKinsey & Company (Monetary Authority of Singapore, 2023). These credits, created from verified emissions reductions achieved by retiring coal-fired power plants early and replacing them with clean energy assets, serve as a complementary revenue stream for the overall repurposing project. Plant owners can use this revenue stream to service SLGBs.

Under this approach, a portion of SLGB proceeds would fund early repurposing projects. The issuer generates transition credits quantified by an approved methodology upon achieving decommissioning and renewable addition targets. The issuer then monetises these credits by selling to entities seeking carbon offsets.

The regulatory framework should mandate that the issuer ring-fence and explicitly earmark the proceeds from the transition carbon credit transactions towards servicing the SLGB debt obligations, providing bondholders additional cashflow assurance. Third-party verification would ensure carbon credit integrity per established standards.

Integrating transition credits allows issuers to leverage an added revenue stream, enhancing the economic viability of repurposing projects while giving bondholders extra debt service coverage from the transition credit revenue.

15.2.2.2 SLGBs: Ideal for Repurposing Coal-fired Power Plants

The proposed SLGB structure can catalyse repurposing by private companies, aligning financial incentives with sustainability targets like coal retirement and renewable addition. Blending SLGB with public finance would further enhance the economic viability of the bond.

The structure also opens up an avenue for public and private debt providers to participate in the early retirement of India's coal plants. The mechanism also addresses greenwashing concerns as it ensures issuers utilise funds for their intended purpose. As such, the transaction's credibility will grow. Moreover, coal-fired power producers will have an incentive to act early and support a just transition. Our proposed use of transition credits, formed after verifying emissions reductions from repurposing projects, adds to the issuer's revenue stream for servicing SLGBs. Most significantly, the mechanism primarily utilises market-based mechanisms, with some support from MDBs, to aid India's pursuit of emissions reduction goals.

15.3 Green Finance Platform for Mobilising Funds to Decarbonise MSMEs

India is second only to China with 63 million MSMEs, which play a pivotal role in the nation's social and economic development. In the fiscal year (FY) 2023–2024 (till September 2023), they contributed a substantial 29.15% to India's GDP and an impressive 45.56% of its overall exports (PIB, 2023). Besides, MSMEs provide direct livelihoods to 190 million people (The Economic Times, 2024). Moreover, their penetration in rural and semi-urban areas and widespread geographic distribution give much-needed regional balance in economic development. As India progresses, MSMEs will continue to be indispensable drivers of economic growth and sustainable development.

MSMEs use a substantial 25% of the energy consumption of large industries (OECD, 2022) making their decarbonisation vital for meeting India's climate objectives. Additionally, the economic and social importance of MSMEs requires special consideration from policymakers as the reshaping of industrial structures and dynamics from the green economic transition can cause social repercussions. While significant opportunities exist for MSMEs to thrive in this transition, such as the increasing demand for electric vehicle components, there are also risks of destabilisation for those unable to adapt their manufacturing facilities and processes to meet new demands.

15.3.1 Financing Challenges for MSMEs Decarbonisation

Financing per se has always been a key challenge for MSMEs, with mainstream financers usually denying them loans. Even when financiers provide loans, they add stringent terms and conditions, including high interest rates, heavy collateral demand, and personal guarantees. Small project ticket sizes, high transaction costs, limited historical record, lack of transparency, dated financial reporting, high close-down ratio, and low competitiveness compared to large companies discourage mainstream financers from lending to MSMEs (Jena, 2021). Only 14% of India's MSMEs have access to credit from mainstream financiers, translating into a USD 530 billion (INR 44.3 trillion) credit gap in the segment (Choksi, 2024).

Decarbonisation requires significant upfront costs for investment in various low-carbon technologies (e.g., rooftop solar energy systems, energy-efficient equipment, etc.). The lack of credit available at a reasonable cost will hinder MSMEs' decarbonisation plans, even if it helps them become competitive and improve financial performance. The latter is true because energy costs for the most polluting manufacturing sector MSMEs account for 10–30% of their total production costs (Power Line, 2020) As a result, there is a clear incentive to invest in energy-efficient plants and machinery and source electricity from cheaper renewable sources. In the absence of market-determined capital availability, policymakers need to intervene to support MSMEs in accessing debt at an affordable rate, enabling them to decarbonise and be competitive in the era of green economic transition. The support will help the country's effort to green the economic system and achieve its sustainable development goals.

The key technological options for renewable energy, energy efficiency and electrification (primarily heating) are capital-intensive. All these technologies need medium and long-term low-cost capital to justify the heavy investment that will allow the user to recover its principal investment and generate additional returns. Banks are reluctant to offer long-term debt to MSMEs and short liability duration limits the exposure to long-duration debt. In addition, banks have limitations to investing in energy-specific sectors as multiple technologies (e.g., renewable energy utilities, transmission, etc.) compete

for the same pie of capital and with large-scale utility companies (e., thermal power plants, utility-scale solar, and transmission companies). Moreover, banks already have significant exposure to MSMEs in their loan books. Therefore, banks are unlikely to grow their MSME loan books quickly to meet the latter's funding needs for low-carbon technologies.

The capital market route is ideal for any borrower as it can provide long-term capital and possibly at a lower rate. Low credit rating, stringent paper requirements to raise capital, and small transaction volumes limit MSME access. Even large corporates in India rely on bank financing instead of the capital market for their debt needs. We propose a government-supported green finance platform through which MSMEs can borrow from the capital market.

15.3.2 Proposed Green Finance Platform

Our proposal starts with an institution setting up a green finance platform, which would act like a financial facility inside the institution. Figure 15.2 sketches the architecture for the proposed platform. The platform would develop eligibility criteria for green loans for MSME borrowers. The requirements would consider the green aspects of projects/technologies (e.g., GHG reduction potential) in which the borrower would deploy the capital proceeds. Alternatively, the platform would provide financial intermediaries, such as commercial banks and Non-Banking Financial Companies (NBFCs), that would lend to eligible MSMEs. Banks and NBFCs would meet similar criteria and conditions (e.g., offering loans for rooftop solar only to MSMEs) to qualify for lending. Green loans can take different forms – term loans, revolving credit facilities or even working capital.

The institution would raise debt by issuing green bonds in the capital market earmarked only for MSMEs meeting the above criteria. The issuance will follow the Securities and Exchange Board of India (SEBI)'s green bond guidelines (SEBI, 2016). The platform would ensure regular impact reporting of green bonds to investors based on the International Capital Market Association's guidelines to attract foreign investors (ICMA, 2024). It would use the proceeds to provide green loans to MSMEs. The platform would also follow the Loan Market Association's Green Loan Principles (GLP) (LMA, 2023) to boost bond investors' confidence regarding loans flowing into green businesses.

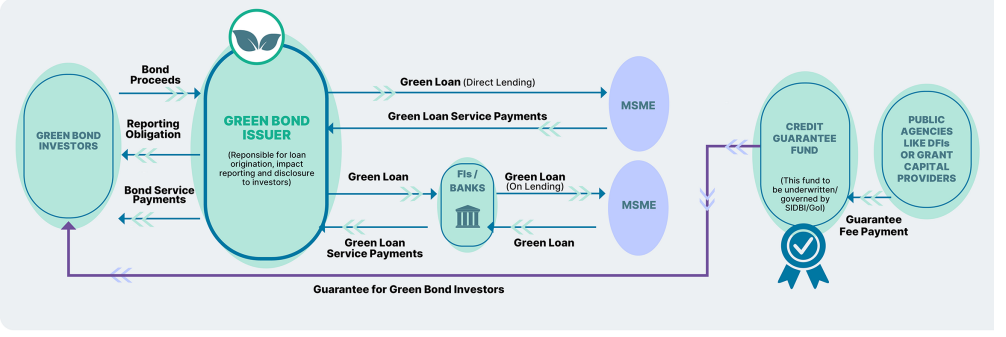

Figure 15.2 Green Finance Platform for MSMEs

Source: Authors

Finally, the platform would appoint a third-party verification agency to ensure loans fund green projects. As greenwashing concerns investors, particularly foreign investors, aligning with international standards and appointing a third-party verification agency would assuage fears. When other commercial banks or NBFCs receive green loans, they must follow the GLP principle as discussed above.

15.3.2.1 Credit Enhancement Mechanisms

Credit enhancement by public institutions and philanthropies can raise the issuer's profile. It helps improve the bond issuance term (e.g., longer tenor, lower rates, etc.). We suggest creating a credit guarantee fund that offers additional cushion to bond investors. Risk sharing between borrowers, lenders, and guarantors is the key to the success of a credit guarantee scheme. An improper credit guarantee structure can reduce moral hazard among borrowers and lenders.

We suggest governments, foundations, donors and bilateral institutions provide guarantee fees. They support MSME decarbonisation in developing countries by giving risky, concessional capital and grants to banks and financial institutions to create financial and development additionality. They can offer grants and risky capital to create a guarantee fund to enhance the credit profile of the facility. For example, grants or concessional capital can be used to offer partial credit guarantees to bond investors. A partial credit guarantee can give additional cushion to the institution issuing green bonds as a portion of credit risk can go to the credit guarantee providers.

15.3.2.2 MDBs as Cornerstone Investors

MDBs and multilateral financial institutions (MFIs) can be cornerstone investors that can attract private investors to green bond offerings. As the former institutions have a mandate to invest in green technologies and support MSMEs in developing countries, they would invest in these bonds. As climate finance increasingly gains attention from these multilateral institutions, they can demonstrate low-carbon technologies' commercial viability. They would hold securities till the private investors are confident about the credit profile of these bonds and can exit after that instead of competing with private investors. Their participation also gives confidence to private investors concerned about greenwashing, as MDBs conduct extensive due diligence before investment.

15.3.3 SIDBI: The Ideal Institution to Govern the Platform

An institution with a high credit rating and experience in raising long-term debt capital from the capital market would be ideal to set up and manage the platform. Besides, the institution must have experience in the MSME lending business, a strong balance sheet, an understanding of the risks and opportunities of climate change on the financial performance of borrowers, and a commitment to support climate action. The Small Industries Development Bank of India (SIDBI) meets all the aforementioned criteria. It has a mandate to support MSMEs by offering concessional capital and other non-funded support. SIDBI has a high AAA (ICRA) credit rating (ICRA, 2022). It is also an accredited entity of the Green Climate Fund (GCF) (Green Climate Fund, 2021) demonstrating its commitment to supporting climate actions and experience in understanding climate-related

risks and opportunities. Besides, the Indian government backs SIDBI. Through the issuance of green bonds, SIDBI can follow other domestic and international development financial institutions that have successfully issued green bonds and signal their commitment to climate actions. A strong issuer like SIDBI would attract ESG investors looking to generate a significant impact on their investment.

15.3.3.1 Barriers Addressed Through this Platform

The platform can address multiple barriers to Indian MSMEs' investment in low-carbon technologies, including the availability of long-term debt, its high cost, and perceived risk. The aggregation of MSMEs through the green financing platform will allow SIDBI to issue a big-size bond, which could decrease the cost of debt that can pass through to the borrowers of the financing facility (MSMEs). The larger the size of the bond, the more liquidity in the financial market, owing to the lower inventory costs of large bond issuance. This is because more liquid bonds have a lower spread than similar bonds with lower liquidity.

Adequate policy or financial support for MSMEs from the Indian government or SIDBI can help ensure comparatively low interest rates on these loans with longer tenors. This will enable the platform to provide long-term debt to MSMEs at a reasonable interest rate. The platform can demonstrate low-carbon technologies' commercial viability, thereby decreasing the sector's risk perception.

15.3.3.2 Benefits for SIDBI

SIDBI has been increasingly paying attention to green finance in recent years as the organisation realised that MSMEs' participation is important in the country's low-carbon transition. Setting up a green finance platform can unlock long-term green capital from the capital market for SIDBI, which it hasn't yet done. By issuing green bonds, SIDBI can enhance its reputation among investors who have seriously started integrating climate change risk and opportunity in their investment decision-making process. SIDBI can subsequently issue long-term green bonds without relying on short or medium-term financing. The long-term green bonds will help SIDBI strategically deploy capital to support MSMEs investing in low-carbon technologies, including providing venture debt to them.

15.3.4 Challenges and Solutions

MSMEs' poor credit profile is a significant hurdle for any institution, including SIDBI, to issue green bonds at an attractive term as investors consider them too risky. This may negatively affect the issuer's credit profile. The institution can set up a credit guarantee fund to support the green financing platform, similar to the existing Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE), to mitigate these risks (CGTMSE, 2024). As suggested earlier, public and developmental institutions can provide concessional capital to cover guarantee fees instead of passing the cost to creditors. The guarantee fund would absorb the potential default risk of the platform, thereby improving the credit profile of the green bonds issued through the platform. Credit risk coverage of around 60–70% is the most effective for any guarantee fund. It should not be more than 80% to align with the interests of lenders (Levitsky and Prasad, 1987). There will

be moral hazard if credit guarantee coverage is very high – a classical lending issue. The guarantee fund should have experienced staff who can design the scheme and loan underwriting and recovery processes.

MSMEs are not prepared and cannot follow stringent GLP guidelines. MDBs (e.g., World Bank, Asian Development Bank) and development institutions (e.g., Deutsche Gesellschaft für Internationale Zusammenarbeit, United States Agency for International Development) who have experience in conducting similar capacity-building exercises can support SIDBI. They can create a small technical assistance pool covering the technical assistance costs, including capacity building and third-party verification costs.

15.4 Conclusion

The innovative financing mechanisms proposed in this chapter blend capital market solutions with public capital. The SLGBs for repurposing coal-fired power plants and a green finance platform for enabling MSME decarbonisation offer robust pathways to accelerate India's energy transition. These solutions address sector-specific challenges and catalyse investments in low-carbon projects by leveraging diverse capital sources, aligning financial incentives with sustainability targets, and fostering investor confidence. Importantly, they pave the way for a just and inclusive transition, ensuring that no segment of the economy is left behind in India's pursuit of its climate goals while maintaining energy security and economic growth.

Note

1 The proposed mechanism by IEEFA/authors has been discussed in detail by the Reserve Bank of India (RBI) in its recent monthly bulletin titled 'Transitioning India's Power Sector: Repurposing of Coal-Fired Power Plants' (https://m.rbi.org.in//Scripts/BS_ViewBulletin.aspx?Id=22191) and by The Glasgow Financial Alliance for Net Zero (GFANZ) report (https://assets.bbhub.io/company/sites/63/2023/11/GFANZ-Financing-the-Managed-Phaseout-of-Coal-Fired-Power-Plants-APAC-December-2023.pdf (page 107, 284)) on Financing the Managed Phaseout of Coal-Fired Power Plants in Asia Pacific. The report cited our article with complete proposed structure on financing the coal power plants repurposing in India.

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