

ECONOMIC AND FINANCIAL ANALYSIS

A. Financial Intermediary Assessment

1. According to Asian Development Bank (ADB) guidelines,¹ the most important criteria for determining the appropriateness of a financial intermediary's performance are its solvency, profitability, and liquidity. In this respect, since 1988, the Basel Committee on Banking Supervision of the Bank of International Settlements has recommended using capital adequacy, asset quality, management quality, earnings, liquidity, and sensitivity to market risk as criteria for assessing a financial intermediary.

2. **Capital adequacy.** As a non-deposit-taking, nonbank financial institution, the Indian Renewable Energy Development Agency (IREDA) is required by the Reserve Bank of India (RBI) to maintain a capital-risk asset ratio of 15%.² IREDA's capital-risk asset ratio is well above the RBI's regulatory requirement from fiscal year (FY) 2007 (ending 31 March) to FY2013, indicating IREDA's strong ability to withstand financial difficulty and other losses. This also reflects IREDA's standing as a fully government-owned enterprise under the Ministry of New and Renewable Energy (MNRE), which is likely to provide equity support to IREDA when needed. IREDA has a more-than-adequate equity ratio (equity as a proportion of total assets) of 20%–30% (table 1). In summary, IREDA has high capital adequacy, and is under-leveraged and able to take on more borrowings.

Table 1: Capital to Risk (Weighted) Assets Ratio

	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
CRAR	33.68%	34.31%	31.80%	30.68%	35.38%	28.61%	24.75%

CRAR = capital to risk (weighted) asset ratio, FY = fiscal year.

Source: Indian Renewable Energy Development Agency annual reports, various editions.

Table 2: Leverage Ratio

	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
Equity Ratio	27.10%	30.76%	28.33%	25.85%	33.81%	23.95%	23.47%

FY = fiscal year.

Source: Asian Development Bank staff estimates from Indian Renewable Energy Development Agency annual reports, various editions.

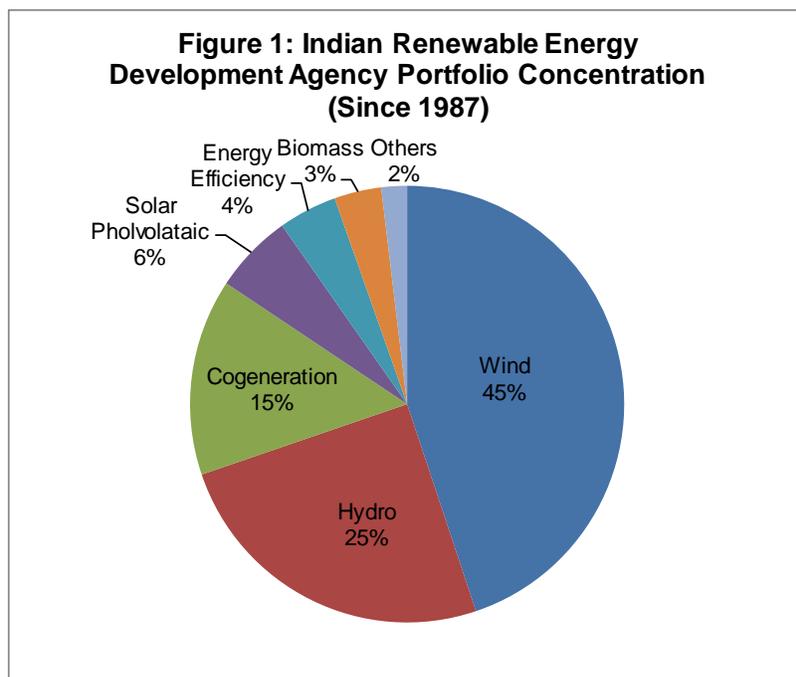
3. **Asset quality.** As a specialized finance company under the MNRE, IREDA has a concentration of portfolios in the renewable energy sector (figure 1). Investments in renewable energy are often riskier than conventional infrastructure finance. IREDA is keenly aware of this portfolio concentration risk and its business plan sets forth plans to diversify its portfolio holdings. In terms of nonperforming assets (NPA), IREDA's definition of 180 days overdue complies with the RBI requirements for a nonbank financial institution, but is not up to the international best practice of 90 days overdue. IREDA's net NPA, which includes recovery and loan loss provisions, improved significantly from 12.52% in FY2007 to 0.92% in FY2013. Under the Securitization and Reconstruction of Financial Assets and Enforcement of Securities Act 2002 and through the Debts Recovery Tribunal, IREDA has been able to improve its loan recovery.³ IREDA significantly improved its gross NPA, which excludes recovery and loan loss provisions, from 19.86% in FY2007 to 3.86% in FY2013. In summary, IREDA's asset quality has improved significantly during FY2007–FY2013, but the business portfolio concentration in a

¹ ADB. 2005. *Financial Management and Analysis of Projects*. Manila (Section 6.4: Assessing FI Performance).

² Reserve Bank of India. Frequently Asked Questions on NBFCs. <http://www.rbi.org.in/scripts/FAQView.aspx?Id=71>

³ International Asset Reconstruction Company. SARFAESI Act and Rules. <http://www.iarc.co.in/content.php?cid=MJA=&mid=NQ==>

single emerging business sector still imposes a higher risk than that faced by more diversified financial institutions.



Source: Indian Renewable Energy Development Agency Annual Report 2012–2013

Note: “Others” includes solar thermal, waste to energy, biomethanation from industrial effluents, biomass, briquetting, biomass gasification and others.

Table 3: Asset Quality Ratios

	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
Net NPA	12.52%	8.00%	3.27%	0.00%	0.79%	2.50%	0.92%
Gross NPA	19.86%	19.25%	13.34%	8.44%	5.31%	5.46%	3.86%
LLPR	12.75%	13.43%	9.10%	9.96%	10.37%	10.06%	5.86%
LLR	0.02%	0.00%	1.82%	0.63%	0.01%	0.59%	0.00%

FY = fiscal year (ending 31 March), LLPR = loan loss provision ratio, LLR = loan loss ratio, NPA = nonperforming assets.

Note: net NPA is calculated after adjustment of including provisions and recovery.

Source: Asian Development Bank staff estimates from Indian Renewable Energy Development Agency annual reports, various editions.

4. **Management quality.** IREDA’s ratio of cost per unit of money lent (measured by dividing the total operating cost by the total amount disbursed) remained stable during FY2007–FY2013 (Table 4). This reflects IREDA management’s relative efficiency in disbursing loans. Combining the findings from the financial management assessment and the comprehensive ADB due diligence on IREDA’s operations, ADB finds that IREDA’s management quality is satisfactory.

Table 4: Cost per Unit of Money Lent

Fiscal Year	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
CPUMLR	4.16%	9.73%	8.02%	6.42%	3.80%	4.07%	4.47%

CPUMLR = cost per unit of money lent ratio, FY = fiscal year.

Source: Asian Development Bank staff estimates from Indian Renewable Energy Development Agency annual reports, various editions.

5. **Earnings.** IREDA's return on assets improved from 1.28% in FY2007 to 2.82% in FY2013, and is favorable compared to the average for the financial service industry. IREDA's return on equity has also improved, from 4.73% in FY2007 to 14.60% in FY2013. Because IREDA has been underleveraged, it has the capacity to take on additional borrowing without requiring additional equity. The interest spread measures the difference between the return on financial assets (from lending activities) and that on liabilities (from financing activities). This ratio has deteriorated slightly during FY2007–FY2013. IREDA's intermediation cost ratio—measured by dividing total operating expenses by total assets—increased from 0.16% in FY2007 to 0.36% in FY2013, indicating a declining efficiency in the use of operating resources. Nevertheless, IREDA's overall earnings are improving.

Table 5: Earning Ratios

	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
Return on assets	1.28%	1.82%	2.10%	2.29%	4.29%	2.84%	2.82%
Return on equity	4.73%	5.91%	7.40%	8.87%	12.70%	11.87%	14.60%
Interest spread ratio	6.30%	5.51%	4.82%	5.75%	4.04%	3.70%	5.35%
Intermediation cost ratio	0.16%	0.50%	0.53%	0.42%	0.31%	0.38%	0.36%

FY = fiscal year

Source: Asian Development Bank staff estimates from Indian Renewable Energy Development Agency annual reports, various editions.

6. **Liquidity.** IREDA must be liquid to meet creditors' demand for repayments. Because IREDA is a non-deposit-taking financial institution, it requires constant access to long-term borrowing, including development assistance and bond issuances, to maintain its operations. From FY2007 to FY2013, IREDA had substantial long-term borrowings from development assistance and local bond issuances to cover its debt repayments. IREDA's liquidity coverage ratio, measured by annual short-term liquid assets over the annual debt payments due, fluctuated from 10.37 in FY2010 to 7.26 in FY2013 (Table 6), but still highly adequate. In light of its capacity to continuously access long-term funds, IREDA is unlikely to experience severe liquidity tightening as a result of expansion of its loans and advances.

Table 6: Liquidity Ratios

	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
L/T Loans to L/T Debt	95.21%	118.07%	112.79%	109.71%	147.09%	114.27%	114.99%

FY = fiscal year, L/T = long-term.

Source: Asian Development Bank staff estimates from Indian Renewable Energy Development Agency annual reports, various editions.

7. **Sensitivity to market risk.** IREDA is a market leader in renewable energy finance in India. IREDA is not as sensitive to interest rate fluctuations and repricing risks as commercial banks are because of its ability to access long-term funds, including from development assistance and local taxable and tax-free bond issuances. Development assistance has an average loan maturity of up to 30 years, while IREDA's local currency (rupee) bonds have a 10–15 years maturity. When borrowing foreign currency loans from the development assistance, IREDA enters into foreign currency and interest rate swap transactions to eliminate associated risks. As a fully government-owned financial institution, IREDA also receives implicit support

from MNRE if equity injection is required. Consequently, IREDA is not overly sensitive to market interest rate risk.

B. Demand Forecast

8. IREDA's demand analysis is in the Demand Analysis supplementary appendix.

C. Financial Projection

9. ADB conducted financial projections of IREDA's financial statements and calculated the relevant financial ratios from FY2014–FY2026. Despite asset growth driven by stable demand for funds, IREDA will likely maintain sound profitability, asset quality, liquidity, and capital adequacy. From FY2014–FY2026, the return on assets is projected to increase from 1.6% to 3.7%, and return on equity is projected to increase from 5.9% to 10.0%. The interest spread will be maintained at about 4.0%–5.0%. The liquidity coverage ratio will also be maintained at above 2.0. The capital–risk assets ratio ranges from 22% to 40%, significantly above the regulatory requirement for nonbank financial institutions of 15%. With the capacity development programs provided by ADB and its development partners, it is anticipated that IREDA will improve its commercial orientation over the project's 10-year implementation period.

D. Financial Analysis—Case Studies

10. The ADB loan to IREDA will be onlent to eligible subborrowers for constructing hydropower, wind, and solar power generation plants. A precise financial analysis on the return of the entire ADB facility cannot be reasonably estimated due to the nature of the credit line. However, for the three main technologies that the facility intends to finance, ADB is able to evaluate sample financial and economic returns. A case study drawn from actual IREDA subprojects is in Table 7.

Table 7: Financial Results for Selected Renewable Energy Projects

	Hydro	Wind	Solar
Total project cost (\$ million)	12.53	24.06	26.96
Project debt (\$ million)	8.77	16.77	16.73
Project equity (\$ million)	3.76	7.28	10.24
Borrowing from IREDA (\$ million)	4.34 (50% debt)	16.77 (100% debt)	16.73 (100% debt)
Tenor (including moratorium)	11 years	13 years	10.5 years
Interest rate (per annum)	12.50%	12.50%	12.75%
Generating capacity (MW)	9.0	25.6	15.0
Capacity utilization	95.0%	21.6%	20.5%
Construction period (months)	33	3	Commissioned
Cost per MW (Indian rupee million)	86.31	58.26	111.45
DSCR (For first 5 years)	1.49	1.36	1.15
WACC (nominal / real)	10.54% / 2.91%	10.26% / 2.65%	11.00% / 3.34%
Tariff per kWh (Indian rupee)	3.50	5.18	9.10
FIRR (after tax, and per annum)	16.13%	16.32%	11.11%
EIRR	20.57%	19.82%	22.22%

DSCR = debt service coverage ratio, EIRR = economic internal rate of return, FIRR = financial internal rate of return, IREDA = Indian Renewable Energy Development Agency, kWh = Kilowatt-hour, MW = megawatt, WACC = weighted average cost of capital.

Source: Asian Development Bank estimates.

11. In term of IREDA's financial return on ADB funds, the net interest margin is roughly 2.62%–4.87%, calculated as follows. The cost of ADB funds to IREDA is roughly 8.88%, or 888

basis points (bps). This is based on the 6-month London Interbank Offered Rate (floating rate) of 33 bps as of September 2014, ADB spread of 50 bps, an ADB rebate of 15 bps for the second half of 2014, dollar–rupee swap cost of about 700 bps, and a Government of India sovereign guarantee fee of 120 bps, assuming no commitment charge or maturity-based premium. IREDA's average lending rate is 11.50%–13.75% per year for hydropower, solar, and wind projects.

D. Economic Analysis

12. The facility's economic rationale is to correct market and nonmarket failures to develop renewable energy projects in India.⁴ As a consequence of market failures, the system-levelized cost (per kilowatt-hour) for renewable energy projects in India often remains higher than that of conventional generation sources, despite improving operational efficiency and the declining cost of renewable energy technology (e.g., solar panels). The high system-levelized costs of solar thermal, offshore wind, and solar photovoltaics reflect the low capacity factor of intermittent energy sources (e.g., wind and sun), and the (often high) associated transmission costs. As a result, the renewable energy sector often requires government support in the form of feed-in-tariffs, renewable purchase obligations, the use of renewable energy certificates, taxes and other investment incentives. It can be argued that conventional power generation is unduly advantaged because negative externalities (in the form of pollution and carbon dioxide emissions) are not priced into the costs.

13. The nonmarket failures refer mainly to IREDA's need to attain full operational efficiency. Poor implementation could lead to higher economic costs and lower economic benefits than those estimated at appraisal. The proposed facility could reduce these risks by introducing a dedicated capacity development program (as an associated technical assistance to the MFF and to be approved in 2014 or 2015) to strengthen IREDA's organizational capacity. This includes the improvement of IREDA's financial and risk management system, support to subproject environmental and social safeguard compliance, development of a more robust information technology system, and establishment of more profitable product lines to diversify its portfolio base.

14. Economic costs include renewable energy subproject capital and operating costs. Economic benefits are incremental and non-incremental. Incremental benefits are the additional power generation to meet India's unserved demand. Non-incremental benefits include mainly the environmental benefits of replacing conventional power generation. Incremental outputs would be valued at the consumers' willingness to pay. Non-incremental outputs would be valued at the resource cost savings to address environment-related issues. However, the design of the financial intermediary loan over a 10-year period under a multi-tranche financing facility modality prevented ADB from calculating a meaningful economic internal rate of return on the entire facility.

⁴ In economic terms, market failures are defined as inefficient allocations of goods and services as a result of various market distortions. Nonmarket failures are defined as aspects that cause higher project costs, lower project benefits, or different consequences from those intended during project appraisal.