

NON-PERFORMING ASSETS AND EXPECTED INVESTMENT FOR CAPACITY ADDITION IN ENERGY SECTOR OF INDIA - TREND ANALYSIS

By

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Abstract

The paper analyses trends in gross and net non-performing assets of Indian banks with a focus on energy sector in India. It also conducts an overview of growing trends in energy consumption, demand, supply and capacity addition since the 8th plan (1992-97) period. We examine the expected energy demand and capacity addition requirements up till 2027, that leads to expected investment requirements for the energy sector which is mainly financed through the financial sector including banks in India. This is a definition paper which is exploratory interpretative in nature where conclusion is stated based on review of supporting data, reports and literature reviews and lists some factors that cause NPA's in Indian banks. It concludes that the level of NPA's of energy sector is alarming and the expected investment requirements in this sector are very high. In light of the changing financial system in India, the fact that effective remedial measures and safeguards to reduce and contain stress and NPA's of energy sector can be formulated only after understanding the significant factors causing them. There is an urgent need to strengthen the financial sector, by research, to bridge this knowledge gap.

Keywords: *infrastructure, energy sector, non-performing assets and project finance.*

Introduction

Reserve Bank of India (RBI) issued guidelines in 1993, based on the recommendations of the Narasimham Committee, which mandated

identification and reduction of non-performing assets (NPA) to be treated as a 'National Priority'. Rajendran and Karthikeyan (2007) suggested the need to consider 'reduction of NPA' in

the banking sector as a national priority item.

As per RBI, RBI/2015-16/101 DBR.No.BP.BC.2/21.04.048/2015-16 dated July 1, 2015, in India, a non-performing asset is an advance for which interest or repayment of principal or both remains overdue for a period of 90 days or more. However, NPA in many countries including Africa refers to a loan that is not paid as and when due (OlaREWaju, 2020).

Over the past decade, in spite of various reforms undertaken in the banking industry, NPAs in commercial banking industry have exhibited a growing trend. The consistent increase in NPAs has not only affected credit growth, but also led to collapse of some commercial banks and forced them towards closure (Nathan *et al.*, 2020).

The concept of NPAs or classified loans is an impediment for sustainable growth of the banking industry (Rahman and Jahan, 2018). The efficiency of a bank/financial institution is evaluated based on profitability and quality of assets it possess (Siraj, 2014). NPAs significantly impact the return on asset

of a bank (Islam *et al.*, 2018). Accordingly, NPA levels need to be closely monitored and evaluated by banks to ensure the banks' existence and stability (OlaREWaju, 2020).

NPAs are not only an indicator of the asset quality and credit risk of a bank, but also determine the efficiency of resource allocation mainly in form of capital to productive sectors (Anjom and Karim, 2016). High level of NPAs in the financial industry adversely affects the level of private investment for economic growth, constrains the bank's lending capacity and its ability to honour its financial commitments when they fall due for payment (Warue, 2013). This results in additional cost for the bank to operate efficiently to enable economic growth (Siraj, 2014).

With the growth of an economy, the financial industry expands and increases its competitiveness (Zheng *et al.*, 2019). In a bank-based economy like India, sound health of the banking system is important for efficient financial intermediation which will lead to overall economic development and financial stability (Lokare, 2014). An economy, with financial stability,

grows rapidly and in a sustainable manner. One of the indicators of financial stability is the level of non-performing assets (NPA) in the financial sector. A robust banking sector is the backbone of any economy (Mittal and Suneja, 2017).

Objective

This paper contributes to literature by presenting and conceptually highlighting trends in NPAs and expected investment of energy sector in India. These increasing trends establish that there is an urgent need to undertake extensive research into the factors which have led to deteriorating asset quality of energy sector projects in India.

Methodology

This is a definition paper which is exploratory interpretative in nature where conclusion is stated based on review of supporting data, reports and research reviews.

Present paper is organized in five sections. First, through literature review, the paper illustrates the negative effects of NPA on the financial sector and economic health of the

country and the need to consider reduction of NPA as a national priority. In the second part of the paper going forward, based on review of data, reports and research, contribution of energy sector in NPA trends in India is high-lighted. Third, expected growth in capacity addition, demand and supply of energy sector of India is presented based on review of data and findings of reports and surveys. Fourth, growth in investment requirement and contribution of energy sector in credit off-take of the financial sector in India is highlighted based on review of data and findings of surveys/reports. In the last section based on key findings we offer some final comments and recommendations.

Non-performing assets of energy sector in India

Financial analysts and rating agencies, including Moody's, maintained a negative outlook on Indian banking and mentioned that the asset quality of banks would continue to deteriorate (Moody's, 2013). It reiterated the fact that even though the post-liberalization period witnessed significant reforms in the banking

sector, the asset quality explained by the level of NPA still worries Indian financial sector, its stability and growth.

Stressed assets being a concern of the government and RBI as causes of poor assets quality in banks, Indian banks have been directed to clean their balance sheet. The Indian banking industry has one of the highest per cents of NPAs compared to international levels (Yadav, 2017).

Singh and Brar (2016) observed that stressed assets have been rising rapidly in India, mainly in public sector banks. Consequently, significant losses

are incurred by the public as well as the Union Government which basically owns public sector banks. The stress assets are mainly in case of infrastructure project especially under public private partnership (PPP).

Growth in gross NPA (GNPA) and net NPA (NNPA) vis-à-vis growth in assets, advances and net profit of schedule commercial banks (SCB) in India are detailed in table no. 1. The increase and decrease in GNPA and NNPA show a corresponding deterioration or improvement in net profit, one of the profitability indicators, of commercial banks in India.

Table 1. Growth in gross NPA and net NPA of India's SCBs (figures in Crores)

Financial year	2017-18	2018-19	% change	2019-20	% change	2020-21	% change
Total Assets	14174606	15255033	7.62	16601045	8.82	18014875	8.52
Total Advance	8476705	9266209	9.31	10287085	11.02	10918918	6.14
Gross NPA	791791	1039679	31.31	936474	-9.93	899803	-3.92
Net NPA	433121	520838	20.25	355068	-31.83	289531	-18.46
Net Profit	43899	(32438)	-173.89	(23397)	27.87	10911	46.63

Source: RBI data source

Even though gross NPA in FY 2020-21 (as on 31.03.2021) is higher than gross NPA in FY 2017-18 (as on 31.03.2018) the gross NPA as a percentage of total assets and total advances of schedule

commercial banks in India have reduced from FY 2018-19 (as on 31.03.2019) as detailed in the table no. 2 below.

Table 2. Gross NPA as % of total assets and advances of India's SCBs

Financial Year	2017-18	2018-19	2019-20	2020-21
Gross NPA as % of Total Assets	5.59	6.81	5.64	4.99
Gross NPA as % of Total Advances	9.34	11.22	9.10	8.24

Source: RBI data source, compiled from table no. 1 above

Energy sector Gross NPA (GNPA) vis-à-vis Gross advances of energy sector of schedule commercial banks in India are detailed in table no. 3. The percentage of energy sector GNPA to

total advances of energy sector of schedule commercial banks in India have been higher than over all percentage of GNPA to total assets and advances of banks in India.

Table 3. Energy sector - gross NPA and advances of India's SCBs (figures in ₹ Crores)

Financial year (As on)	2017-18 (31.03.2018)	2018-19 (31.03.2019)	2019-20 (31.03.2020)	2020-21 (31.03.2021)
Gross NPA (GNPA) of energy sector	127296	117467	73767	48278
Total Advance O/s of energy sector	574118	608815	578903	589174
% of GNPA to Total Advances outstanding of energy sector	22.17	19.29	12.74	8.19

Source: RBI Data of domestic operations of scheduled commercial Banks

The GNPA in energy sector in India as a percentage of total advances of energy sector as on 31st March 2018 is 22.17% as against 9.34% of Total GNPA as percentage to Total Advances of commercial banks in India as on 31st March 2018. Further, GNPA in energy sector as a percentage of total advances of energy sector in India as on 31st March 2021 is 8.19% as against 4.99% of Total GNPA as percentage to Total Assets of commercial banks in India as on 31st March 2021.

As per CRISIL ratings (report 16th February, 2021), stressed assets of non-banking financial companies

(NBFCs) in India alone are expected to reach Rs 1.5-1.8 lakh crore or 6.0-7.5% of the assets under management (AUM), by the end of FY 2020-21.

Mittal and Suneja, (2017), opined that in order to reduce the problem of NPAs, one must first be aware of all the reasons which cause bad loans. The factors that cause non-performing assets can be divided into three categories, one related to the internal functioning of banks, second are the causes accountable to borrowers. Apart from these, there are some macro-economic factors. Causes for rising NPAs in banks in India are:

Causes accountable to banks	Causes accountable to borrower	Other causes
Poor credit appraisal mechanism	Longer gestation time	Fast changing technology
Wrong selection of borrowers	Mis-management of funds	Political warfare
Lack of trained staff	Wrong selection of projects	Taxation laws
Inflexible attitude	Diversion of funds	Credit policies
No delegation of authority	Lack of quality control	Government policies
Lack of proper follow-up by the banks	Rising expenses	Increase in factor cost
Weak post- credit appraisal system	Poor choice of location	Changes in consumer tastes and preferences

Inefficient management of
 lending facilities

Inadequate attention to
 research and
 development

Recession in the market

Source: As cited in Mittal and Suneja, (2017).

Energy sector - current capacity, demand and supply

The Electricity Act which came into force in 2003, brought changes in the Indian energy sector which were revolutionary in many ways as it (a) removed the need for license for generation projects, (b) encouraged competition through international competitive bidding, (c) identified transmission as a separate activity, (d) encouraged more participation from public and private sector, among other reforms introduced by the Act.

This encouraged investment in the power sector. As a result, all India installed capacity as on 31st March 2022 stood at 3,99,496.61 MW as

against the total installed capacity of 1,27,055.97 MW as on September 9, 2008 and 1362 MW as at independence of India (31.12.1947) (Central Electricity Authority of India (CEA), Ministry of Power (MoP), Government of India (GoI)).

As detailed in table No. 4, out of total installed capacity of 3,99,497 MW (as on 31st March 2022), coal is the single largest source of energy for electricity production since 2,35,599 MW is installed in thermal (including coal, lignite, gas and diesel) which is 58.97% of total installed power generation capacity in India. Percentage source wise segregation of all India installed power generation capacity is as follows:

Table 4. All India installed power generation capacity (31.03.2022)

Source	Thermal	Renewable	Hydro	Nuclear
Share (MW)	235599	109886	46722	6780
% Share	59%	27%	12%	2%

Source: CEA, Ministry of Power, GoI

As per the CEA, NEP, January 2018, Ministry of power, GoI, the capacity addition achievement for previous five year plans in India was short of the

target whereas during 12th Plan, the capacity addition achieved is 112% of the target. Details are as follows in table no. 5:

Table 5. India’s power capacity addition achievement – Five year plans

Plan/ Sector (Figures in MW)	8 th Plan (1992-97)		9 th Plan (1997-02)		10 th Plan (2002-07)	
	Target	Actual	Target	Actual	Target	Actual
State	14,870	6,835	10,748	9,353	11,157	6,245
Private	2,810	1,430	17,589	5,262	7,121	1,930
Central	12,858	8,157	11,909	4,504	22,832	13,005
Total	30,538	16,423	40,245	19,119	41,110	21,180
% Achievement	53.70		47.50		51.50	
Plan/ Sector (Figures in MW)	11 th Plan (2007-12)		12 th Plan (2012-17)			
	Target	Actual	Target	Actual		
State	26,783	16,732	15,530	23,277		
Private	15,043	23,012	46,825	55,480		
Central	36,874	15,220	26,182	20,452		
Total	78,700	54,964	88,537	99,209		
% Achievement	69.84		112.10			

Source: CEA, Ministry of Power, GoI.

However, as per the Ministry of power, GoI, the capacity addition achievement for beyond the XII Plan has been short

of the target, the details are as follows in table No. 6:

Table 6. Power capacity addition achievement beyond 12th plan

Year/ Sector (Figures in MW)	2017-18		2018-19		2019-20	
	Target	Actual	Target	Actual	Target	Actual
State	3846	1960	4636	2879	4467	2780

Private	3145	3985	0	972	379	45
Central	6180	3560	3470	2070	7340	4240
Total	13171	9505	8106	5921	12186	7065
%	72.16		73.05		57.97	

Achievement

Source: Ministry of Power, GoI, July 2021

As per CEA, January 2018, the transmission lines at end of the 12th plan period i.e as on March 2017 was 367851 cKm as against 52034cKm at end of 6th plan period i.e March 1985. The same has increased to 443371 cKm at end of 2019-2020 (CEA, MoP, GoI).

Energy sector - expected demand and capacity addition

As cited by Srivastava (2009) research indicates that while total infrastructure stocks increase by 1 per cent with each 1 per cent increment in per capita GDP, household access to safe water increases by 0.3 per cent, paved roads by 0.8 per cent and power by 1.5 per cent.

Growth in power consumption and demand

As per CEA, MoP, GoI (All India electricity statistic review report, October 2020), the consumption of

electricity was 5610 GWh as on 31.12.1950. The consumption has increased to 1209972 GWh during the year 2018-19. The industrial, domestic and agricultural categories constitute the major categories of consumers of electricity, constituting about 42.91%, 23.82% and 17.64% respectively of the total consumption including non-utilities.

Given the fact that the per capita power consumption in India for 2016-17 was 1122 units (kWh) against the world's per capita consumption of 3110 units (kWh), the demand for power in India is expected to grow in the years to come. ("Indian Electricity Scenario", Ministry of Power, July 2018). As per CEA, MoP, GoI, the per capita power consumption was only 1208 units in 2019-20.

As per the CEA report in June 2018, an upsurge in demand has been observed, which is growing at more than 6 per

cent per year. This is further expected to rise because of various government interventions like Saubhagya, Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY), Integrated Power Development Scheme (IPDS), Power for all, solar rooftop, number of electric vehicles in India is likely to be 6 million by the year 2020.

The Ministry of power, GoI, in its National Electricity Plan (NEP), January 2018, estimates that because of the demand created by economic growth, rising population, rapid urbanization and to make up for lack of adequate investment in the recent past, the need for investment in energy infrastructure will rise exponentially with the economic growth rate.

As per the 19th electric power survey by CEA, Ministry of power, India's peak power demand from the levels of 1,70,000 MW is expected to reach 2,35,000 MW by FY 2022 and further increase to 3,18,000 MW by FY 2027.

The Ministry of power, Government of India has presently set an installed capacity target of 1,75,000 MW from renewable energy sources by 2022 i.e 74.47% of total capacity from current

25%. This includes 1,00,000 MW from solar, 60,000 MW from wind, 10,000 MW from biomass and 5000 MW from small hydro power. Within the target of 1,00,000 MW for solar energy, 40,000 MW would be from solar roof tops and the balance 60,000 MW would be from off the ground large and medium scale projects involving both the State Governments and also other institutes like Central Public Sector Undertakings (CPSUs), Independent Power Producers (IPPs), Solar Energy Corporation of India (SECI) etc.

The Government of India has also recently enhanced the renewable energy generation capacity target to 450 GW (4,50,000 MW) by 2030. This is in view to meet India's climate commitments and to achieve energy security.

Power distribution - expected growth in capacity

The Central Electricity Authority (CEA) has anticipated a 40 per cent increase in power distribution infrastructure till 2022. The projection of a 38 per cent increase in distribution substation capacity, 32 per cent increase of distribution transformation capacity

and an increase in different type of feeder lengths by 27-38 per cent till 2022 have been made in the distribution perspective plan, CEA, Ministry of power.

As per the 19th electric power survey by Ministry of power, the expected growth in capacity of transmission lines, substations and HVDC's during 2017 till 2022 will be as detailed in table no. 7 as follows:

Power transmission system - expected growth in capacity

Table 7. Expected growth in transmission line capacity

	As on March 2017	Addition from 2017-22	As on March 2022
Transmission Line (cKM)	367851	107500	475341
Substations (MVA)	721265	333475	1054744
HV DC's (MW)	19500	14000	33500

Source: CEA, NEP, MoP, GoI

Financial sector investment in energy sector

take by commercial banks in India as on March 2021.

In alignment with the classification of Basic Statistical Returns (BSR) System/National Industrial Classification (NIC), information on financial credit to industry is obtained for 18 broad sub-categories of the industrial sector which constitutes around 80% of the financial sector credit off take. As per, RBI's sectorial deployment of bank credit in India, infrastructure with ₹916765 crore accounts for 31.42% of credit off-take out of the overall industrial sector off-

Bank's credit off-take by infrastructure witnessed a significant increase from one-fifth (20.71%) of the credit off-take by industry in March 2007 to more than one-third (31.42%) contribution in March 2021. Table no. 8 details the percentage contribution of sub-sectors contribution in the overall industrial credit off-take of commercial banks in India over a period last 14 years since 2007 till 2021.

Table 8. % of sector composition in industrial credit of banks in India

Sub-sector	March 2007	March 2013	March 2019	March 2021
Infrastructure	20.71	32.92	30.20	31.42
Basic metal & metal product	12.10	14.12	12.80	11.27
Food processing	10.50	8.21	5.40	5.25
Others	56.69	44.75	51.60	52.51

Source: compiled based on RBI - Sectorial Deployment of Bank Credit in India.

In comparison to other sub-sectors, credit to energy sector (power) is more than half (61.91%) of the credit to infrastructure, as on March 2021.

Table no. 9 details the share of credit off-take by the energy (power) sector within the infrastructure sector in India. The share of energy sector credit

off-take within the overall infrastructure sector credit off-take has been increasing for more than the last decade since March 2008 till March 2021 from 46.32% in March 2008 to 61.91% in March 2021.

Table 9. Indian Banks credit off-take: outstanding (100 Crores)

	Mar. 2008	Mar. 2011	Mar. 2014	Mar. 2018	Mar. 2021
Infrastructure	2053	5214	8364	8909	9168
Energy (Power)	951	2666	4869	5196	5676
Energy as a % of Infrastructure	46.32	51.13	58.21	58.72	61.91

Source: compiled based on RBI - Sectorial Deployment of Bank Credit in India.

It is evident from the above that since March 2008 up till March 2021, exposure to infrastructure sector witnesses one of the highest annual

growth rates of 26.65 % and a compound annual growth rate (CAGR) of 12.20 % as far credit outstanding in the industrial credit of banking system

is concerned. Further, the energy sub-sector has the highest share of 61.91% in banks credit off take within the overall Infrastructure sector outstanding with an annual growth rate of 38.22 % since March 2008 with a CAGR of 14.73%.

Investment requirements for capacity addition in energy sector in India

As per the 19th electric power survey, Ministry of power, the total fund requirement for power generation capacity addition for the period 2017-2022 is estimated to be 11,55,652 Crores. Mode-wise requirement during 2017-2022 is contained in table no. 10 as follows:

Table 10. Investment requirement for capacity addition 2017-22 (Crore)

Year	Thermal	Hydro	Nuclear	Renewables	Total
2017-18	76,781	15,622	9,479	1,19,931	2,21,813
2018-19	73,376	19,465	9,728	1,38,218	2,40,787
2019-20	52,915	23,461	8,088	1,43,422	2,27,885
2020-21	55,846	26,431	11,912	1,44,218	2,38,406
2021-22	63,991	29,546	16,127	1,17,096	2,26,761
Total	3,22,908	1,14,524	55,334	6,62,885	11,55,652

Source: CEA, NEP, Ministry of Power, Gol.

The total fund requirement for power generation capacity addition for the period 2022-27 is estimated to be

9,56,214 crores. Mode-wise requirement is contained in table no. 11 as follows:

Table 11. Investment requirement for capacity addition 2022-27 (Crore)

Year	Thermal	Hydro	Nuclear	Renewables	Total
2022-23	77,663	31,932	19,390	1,15,917	2,44,902

2023-24	71,837	26,105	18,435	1,16,179	2,32,556
2024-25	65,778	18,267	17,173	1,16,320	2,17,538
2025-26	50,544	10,116	16,194	1,12,408	1,89,262
2026-27	25,767	3,416	8,514	34,259	71,956
Total	2,91,589	89,837	79,706	4,95,082	9,56,214

Source: CEA, NEP, Ministry of Power, GoI.

As per CEA, NEP, MoP, GoI, estimated expenditure of 2,54,000 crore would be required for implementation of additional transmission system in the country (transmission lines, substations, and reactive compensation etc.) during the plan period 2017-22.

Generally developers make an equity contribution of 20%-30% in the total project cost for a power generation/transmission/ distribution project, it is estimated that for the period 2017-22, developers will be required to infuse equity amount totaling to 3,49,235 Crores and will have to arrange for total debt of 10,60,416 Crores. Similarly, the equity and debt requirement for the period 2022-2027 are estimated as 2,62,110 Crores and 6,94,104 Crores respectively.

Thus a total of 17,54,520 Crores in form of debt (loan) will be required to fund the investment requirement for capacity addition in the energy sector up till 2027. The current sources for debt financing in India are mainly from financial institution (FI) and banks.

Conclusion

The asset quality is a prime concern and impacts various performance indicators, i.e., profitability, costs, liquidity, income generating capacity and overall functioning of banks and Financial Institutions. Erosion in asset quality results in stress in loan portfolio and accumulation of Non-Performing Assets (NPAs).

NPAs have been the root cause of recent global financial crisis and have been drawing the attention of policy makers and academicians alike. Mere

recognition of the problem has been able to reduce NPA to a great extent (Meenakshi *et al.*, 2010).

In the present scenario, NPAs have been the most vexing problem faced by commercial banks. The Government of India and Reserve Bank of India have initiated various measures to control NPAs in the post reform years. But banks are yet to solve the dilemma. This needs to be remedied. Thus, it is pertinent to examine the asset quality and NPAs of commercial banks in the present global competitive scenario. An investigation in respect of asset quality and NPAs of banks is therefore likely to be a highly related academic issue particularly in backward and emerging regions (Gautami *et al.*, 2015).

The increase and decrease in GNPA and NNPA in India have a corresponding deterioration or improvement in net profit, one of the profitability indicators, of commercial banks in India.

The percentage of energy sector GNPA in India to total advances of energy sector of schedule commercial banks

have been higher than over all percentage of GNPA to total assets and advances of schedule commercial banks in India.

The GNPA in energy sector as a percentage of total advances of energy sector in India as on 31st March 2018 is 22.17% as against 9.34% of Total GNPA as percentage to Total Advances of commercial banks in India as on 31st March 2018. Further, GNPA in energy sector as a percentage of total advances of energy sector as on 31st March 2021 is 8.19% as against 4.99% of Total GNPA as percentage to Total Assets of commercial banks in India as on 31st March 2021.

As discussed above, there is a substantial gap between the investments required in the energy infrastructure sector in India and the finances available to achieve the growth and demand requirements as forecasted in the 19th Electric Power Survey, CEA, NEP (January 2018) by Ministry of Power, Government of India.

Up till 2027, a total of 23,65,865 Crores is the estimated investment in the

energy sector in India, 14,09,651 Crores during the period 2017-22 and 9,56,214 Crores for the period 2022-2027 (CEA, NEP, MoP, GoI). This huge investment, including the National Infrastructure Pipeline (NIP) requirements, is proposed mainly through debt funding by financial institution and banks. Currently in India, commercial Banks and NBFC's are required to lend to such projects of longer gestation period and need to critically scrutinize and evaluate such projects in terms of all structural features and determine the viability of each project for financing.

The results of reforms and measures undertaken by the Government of India and RBI since 1991, in terms of recommendations by various committees including the two Narasimham committee reports, to reduce and contain NPA's on 'National Priority' seem to have been neutralized, putting sustainability of the Indian financial sector at great risk.

It is clear from the above and literature review that, the level of NPA's of energy sector is alarming and their exponential growth in recent years has given rise to an urgent need to strengthen the financial sector, by research, to bridge the knowledge gaps.

In addition to the existing commercial banks and NBFC's in India, long term Development Financial Institutions (DFIs) are now being introduced by the Government of India through its Union Budget 2021-22 to play a role in financing infrastructure projects (The National Bank for Financing Infrastructure and Development Act 2021). The fact that effective remedial measures and safeguards to reduce and contain stress and NPA's of energy sector can be formulated only after understanding the significant factors causing them. There is a need to undertake extensive research into the factors which have led to deteriorating asset quality of infrastructure sector mainly energy sector project of India.

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